<ART-045-0>

SERVICE MANUAL

AM/FM STEREO RECEIVER

SX-838

KCU, F, GN

NOTE:

MODEL SX-838 COMES IN THREE VERSIONS DISTINGUISHED AS FOLLOWS:

Round label on rear panel	Voltage	Type
KCU	120V only	UL (U.S.A.) and CSA (Canada) approved
F	5-position selector	General export model
GN	220V only	SEMCO (Sweden), NEMCO (Norway) and DEMCO (Denmark) approved

PIONEER®

CONTENTS

About 220V only model labeled "GN"

This model whose rear panel is labeled "GN" circular mark operates only on 220V, substantially in its circuit design from two other models. When repairing this model, please see the manual on page 75 and the followings which include such items as Circuit connection diagram, Miscellaneous parts list, Schematic diagram of power supply circuit assembly, P.C. board pattern and its parts list.
Before servicing, also please do not fail to check to see if the "GN" mark is labeled on the rear panel.

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14. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERN AND PARTS LIST FOR 220V ONLY MODEL

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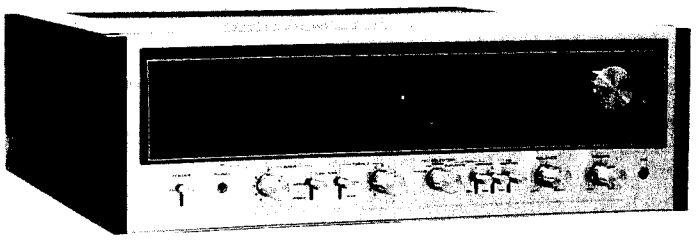


1. SPECIFICATIONS

SEMICONDUCTORS

FETs	4
ICs	4
Transistors	43
Diodes	24

AMPLIFIER SECTION

Continuous Power Output 20Hz~20kHz	
(Both channels driven)	50W + 50W (8Ω) 60W + 60W (4Ω)
1kHz	55W + 55W (8Ω)
(Both channels driven)	70W + 70W (4Ω)
Harmonic Distortion (20Hz~20kHz Continuous Power Output)	Less than 0.3%
(1W+1W, Power Output)	Less than 0.05%
Intermodulation Distortion (Continuous Power Output)	Less than 0.3%
(1W+1W, Power Output)	Less than 0.05%
Power Bandwidth (IHF, Both channels driven)	5Hz~40kHz (T.H.D. 0.3%)
Frequency Response	10Hz~70kHz
Input Sensitivity/Impedance	
POWER AMP IN	1V/50kΩ
Output Speaker	A, B, C, A + B, A + C, B + C (4Ω~16Ω)
Headphone	4Ω~16Ω
Damping Factor (1kHz, 8Ω)	More than 45
Hum & Noise (IHF, short-circuited, A Network)	More than 110dB
Residual Hum & Noise (8Ω, Pre & Power amplifier)	Less than 1mV

PREAMPLIFIER SECTION

Input Sensitivity/Impedance	
PHONO 1	2.5mV/50kΩ
PHONO 2	2.5mV/50kΩ
PHONO Overload Level (rms/p-p)	170mV/480mV
MIC	2.0mV/50kΩ
AUX	150mV/80kΩ
TAPE PB 1, 2	150mV/80kΩ
TAPE PB 2 (DIN connector)	150mV/80kΩ
Output Level/Impedance	
TAPE REC 1, 2	150mV
TAPE REC 2 (DIN connector)	30mV/80kΩ
PREOUT	1V/2kΩ
Harmonic Distortion (20Hz~20kHz)	Less than 0.1%
Frequency Response	
PHONO (RIAA equalization)	30Hz~15kHz ±0.3dB
AUX, TAPE PB	15Hz~40kHz $^{+0}_{-1}{}^{.5}$ dB
Tone Control	
BASS	±6dB (100Hz), ±10dB (100Hz) TURNOVER FREQUENCY: 200Hz, 400Hz
TREBLE	±7dB (10kHz), ±11dB (10kHz) TURNOVER FREQUENCY: 5kHz, 2.5kHz
Filter	
LOW CUT	–8dB (50Hz) 6dB/oct.
HIGH CUT	–9dB (10kHz) 6dB/oct.
Loudness Contour (Volume control set at –40dB position)	+8dB (100Hz), +4dB (10kHz)
Hum & Noise (IHF, short-circuited, A Network)	
PHONO	More than 70dB
MIC	More than 65dB
AUX, TAPE PB	More than 95dB
Muting	–20dB

FM SECTION

Usable Sensitivity (IHF)	1.8μV
Capture Ratio (IHF)	1.0dB
Selectivity (IHF)	80dB
Signal-to-Noise Ratio	70dB
Image Rejection (98MHz)	85dB
IF Rejection (98MHz)	100dB
Spurious Rejection	100dB
AM Suppression	55dB
Harmonic Distortion	
MONO	Less than 0.2%
STEREO	Less than 0.4%
Frequency Response	20Hz~15kHz $^{+0.2}_{-2.0}$ dB 50Hz~10kHz $^{+0.2}_{-0.5}$ dB
Stereo Separation 1kHz	More than 40dB
50Hz~10kHz	More than 30dB
Sub Carrier Suppression	65dB
Antenna Input	300Ω Balanced 75Ω Unbalanced
Muting	ON–OFF

AM SECTION

Sensitivity (IHF, Ferrite antenna)	300μV/m
(IHF, Ext. antenna)	15μV
Selectivity	40dB
Signal-to-Noise Ratio	50dB
Image Rejection	65dB
IF Rejection	85dB

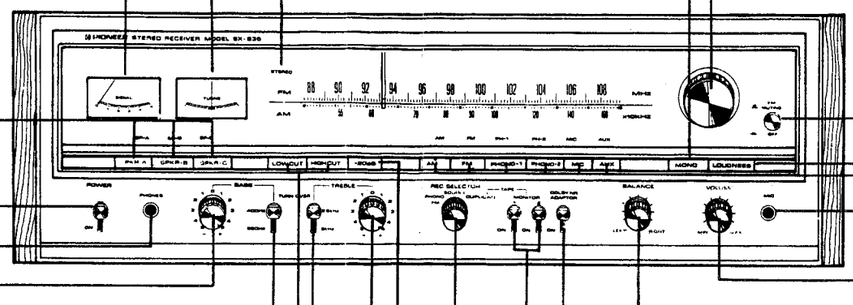
MISCELLANEOUS

Power Requirements	AC 120V 60Hz or 110, 120, 130, 220 and 240V (switchable) 50/60Hz
Power Consumption	240W (UL approved model only) 350W (5-line voltage model only)
Dimensions	520(W)x175(H)x420(D)mm 20-1/2 x 6-7/8 x 16-9/16 in.
Weight Without Package	16.2kg (35 lb 10 oz)
With Package	20.3kg (44 lb 11 oz)

FURNISHED PARTS

FM T-type Antenna	1	
Operating Instructions	1	
Fuse 4A	1	(5 line voltage model only)
Fuse 2A	1	(5 line voltage model only)

2. FRONT PANEL FACILITIES



SIGNAL METER

For AM and FM station tunings.

AM tuning: Tune the dial pointer so that the SIGNAL meter needle comes to the extreme right.

FM tuning: Both the SIGNAL and FM TUNING meters work together. The optimum point of the SIGNAL meter needle is the same as in AM tuning. Then use the FM TUNING meter.

SPEAKER BUTTONS

Each of speaker systems A, B, and C is connected to each of output terminals A, B, and C.

By pushing the following:

SPKR-A .... Speaker systems A into operation

SPKR-B .... Speaker systems B into operation

SPKR-C .... Speaker systems C into operation

NOTES:

1. *When any two pairs of the buttons (A + B, B + C, C + A) are depressed, the corresponding pairs of speaker systems will come into operation. However, operating all three buttons even though depressed at the same time is not possible.*
2. *Only when listening through headphones, press again the SPKR button(s) in use to OFF (undepressed) from the ON position (pressed).*

POWER SWITCH

Turn this switch ON but wait for some 3 to 6 seconds, during the silence of which the protection circuit eliminates the unpleasant noise not imputed to a receiver fault.

PHONES OUTPUT JACKS

Accepts stereo headphones.

BASS CONTROL

Clockwise rotation gives stronger emphasis of the bass range below the turnover frequency (which is selected by the BASS TURNOVER switch). Counterclockwise rotation reduces bass response. This control knob has click-stops.

BASS TURNOVER SWITCH

This switch selects the frequency below which the bass tone control will begin to act. This "turnover" frequency can be set at 400Hz or 200Hz, to match the characteristics of the room, the program material, or your personal listening preferences.

LOW CUT, HIGH CUT BUTTONS

LOW ..... When the low-pitched rumble (turntable motor or other source) is obtrusive, depress the LOW CUT button to ON. In no interference, leave it undepressed (OFF).

HIGH ..... When the high frequency scratch noise (records or other source) is much, depress this button to ON. In no interference, leave it undepressed (OFF).

FM TUNING METER

While getting the SIGNAL meter needle going to the right, make fine adjustment with the FM TUNING meter whose needle comes to the center (indicating the optimum reception).

FM STEREO INDICATOR

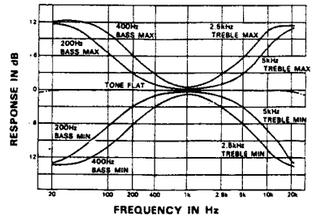
TREBLE TURNOVER SWITCH

This switch selects the frequency above which the treble tone control will begin to act. This "turnover" frequency can be set at 2.5kHz or 5kHz, to match the characteristics of the room, the program material, or your personal listening preferences.

The effect of the tone controls and turnover switches is illustrated in the below.

TREBLE CONTROL

Clockwise rotation gives stronger emphasis of the high range above the turnover frequency (selected by the TREBLE TURNOVER switch). Counterclockwise rotation reduces high-range response. This control knob has click-stops.



MODE BUTTON

Leave this button undepressed (if necessary, depress this to release it when already depressed) for STEREO playback. For MONO playback, depress it. In this case stereo signals for left and right channels will be mixed into mono signal which will be heard from the center of both speaker systems.

TUNING KNOB

REC SELECTOR SWITCH

Each setting this switch to FM, PHONO and DUPLICATE permits recording on tape of the tape deck connected to the TAPE 1 terminals of the SX-838. Recording from speaker systems can be made in the ordinary manner only when this switch is set to SOURCE.

FM: FM broadcasts can be recorded.

PHONO: Disc records on the turntable can be recorded.

SOURCE: For all other modes of operation such as record playing, radio reception, etc.

DUPLICATE: Recorded tape can be duplicated or edited with two tape decks.

AUDIO MUTING BUTTON –20dB

Depress this button to mute the audio input to –20dB. No need to turn down the VOLUME control on each occasion for your convenience.

FM MUTING BUTTON

Leave this button undepressed (in the ON position) while tuning in FM stations. Inter-station noise may interfere with FM reception while tuning between stations. To suppress this noise, leave the MUTING button undepressed (in the ON position). If the low signal strength is due to distance from the transmitter or other influences, depress this button, at which the weak station will be heard with the MUTING "OFF."

LOUDNESS BUTTON

Depress this button to listen at low volume. The human ear's frequency response varies according to the listening volume. The depressed button compensates for hearing response with emphasis on the bass and treble.

FUNCTION SELECTOR BUTTONS

For selecting the program source, push each button as follows:

AM ..... For AM broadcast reception.

FM..... For FM broadcast reception. The STEREO indicator lights up when the broadcast is in stereo.

PHONO 1 ... For operating a turntable connected to the PHONO 1 input jacks.

PHONO 2 ... For operating a turntable connected to the PHONO 2 input jacks.

MIC ..... For using a microphone. Not possible to mix with other program source.

AUX ..... For listening to audio equipment (cartridge tape player, TV sound tuner, etc.) connected to the AUX input jacks.

MIC INPUT JACK

Accepts the plug of the microphone.

VOLUME CONTROL

Governs both the volume of sound outputs from the speaker systems and from the headphones.

BALANCE CONTROL

Adjusts the balance between the sound volume from the left and right speaker systems.

DOLBY NR ADAPTOR SWITCH

When employing Dolby Noise Reduction Adaptor depress this DOLBY NR ADAPTOR to ON.

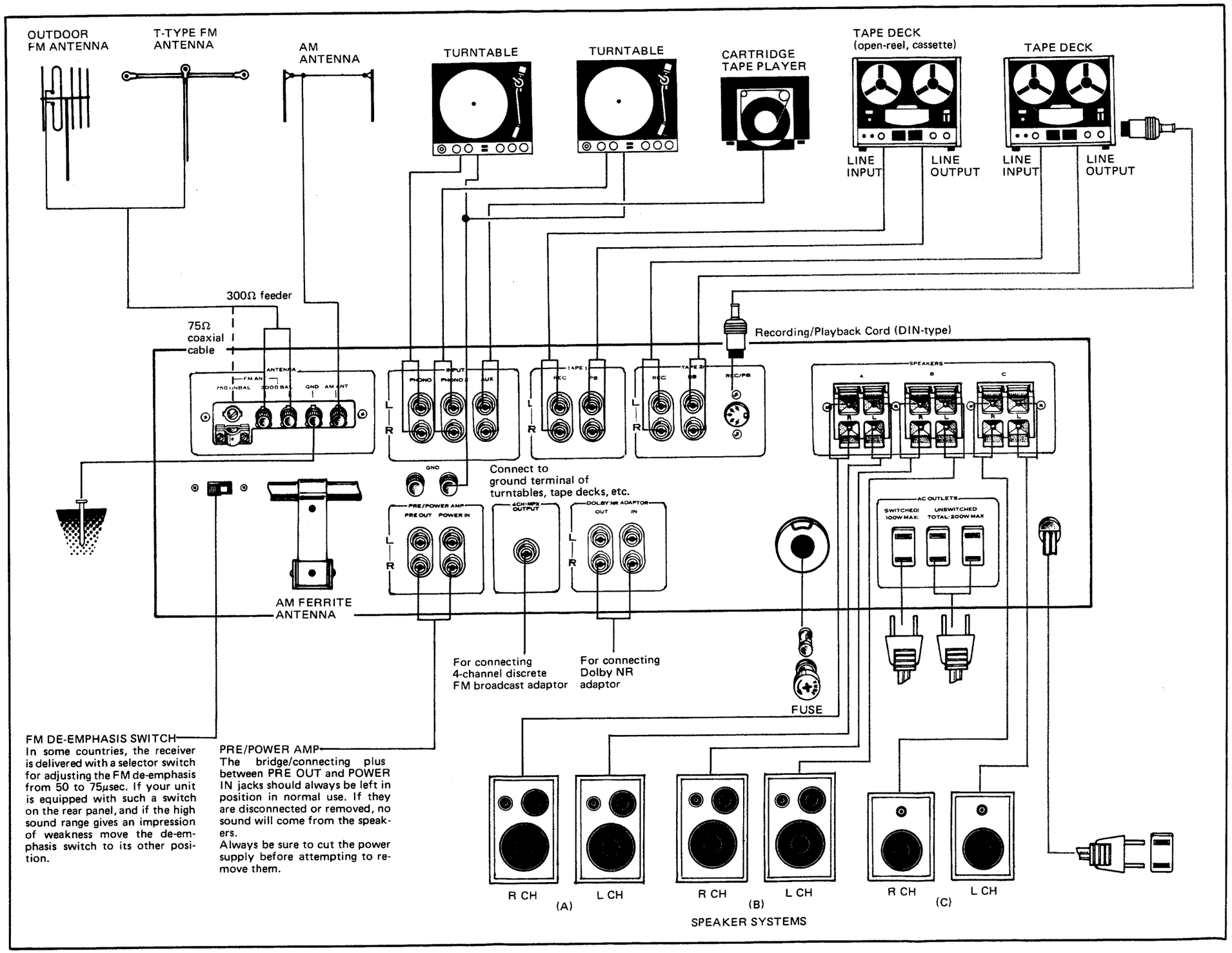
TAPE MONITOR (1, 2) SWITCHES

Monitor the recorded sound while recording with a tape deck. Also possible to play back tapes as follows:

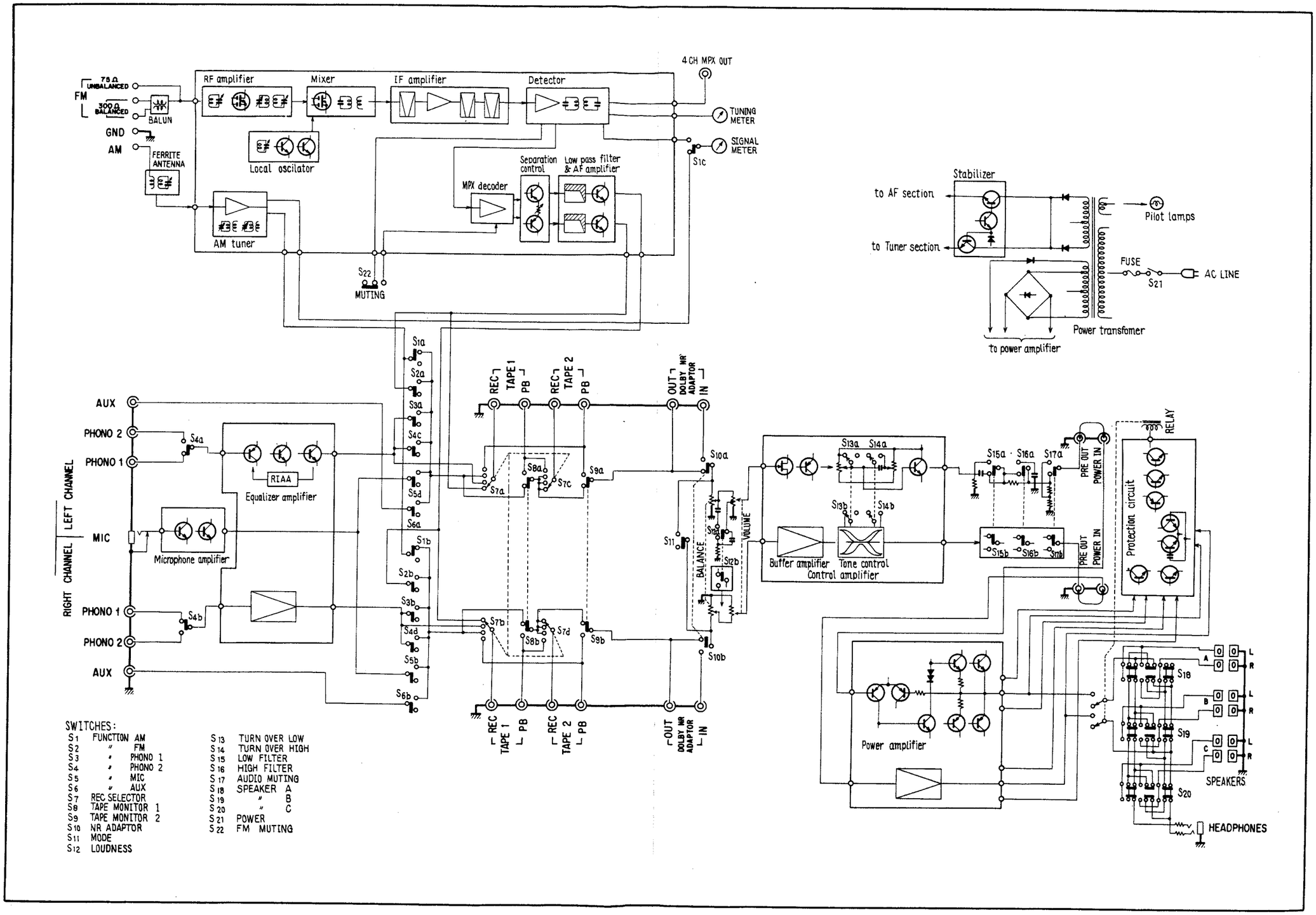
1 ..... With a tape deck connected to the TAPE 1 jacks (REC and PB), either monitoring of recording in progress of playing back is possible.

2 ..... With a tape deck connected to the TAPE 2 jacks (REC and PB or REC/PB connector), the same as in 1 above is possible.

3. CONNECTION DIAGRAM


OUTDOOR FM ANTENNA
T-TYPE FM ANTENNA
AM ANTENNA
TURNTABLE
TURNTABLE
CARTRIDGE TAPE PLAYER
TAPE DECK (open-reel, cassette)
TAPE DECK
LINE INPUT
LINE OUTPUT
LINE INPUT
LINE OUTPUT
300Ω feeder
75Ω coaxial cable
Recording/Playback Cord (DIN-type)
Connect to ground terminal of turntables, tape decks, etc.
AM FERRITE ANTENNA
For connecting 4-channel discrete FM broadcast adaptor
For connecting Dolby NR adaptor
FUSE
FM DE-EMPHASIS SWITCH
In some countries, the receiver is delivered with a selector switch for adjusting the FM de-emphasis from 50 to 75μsec. If your unit is equipped with such a switch on the rear panel, and if the high sound range gives an impression of weakness move the de-emphasis switch to its other position.
PRE/POWER AMP
The bridge/connecting plus between PRE OUT and POWER IN jacks should always be left in position in normal use. If they are disconnected or removed, no sound will come from the speakers.
Always be sure to cut the power supply before attempting to remove them.
R CH
L CH
(A)
R CH
L CH
(B)
R CH
L CH
(C)
SPEAKER SYSTEMS

4. BLOCK DIAGRAM



SWITCHES:

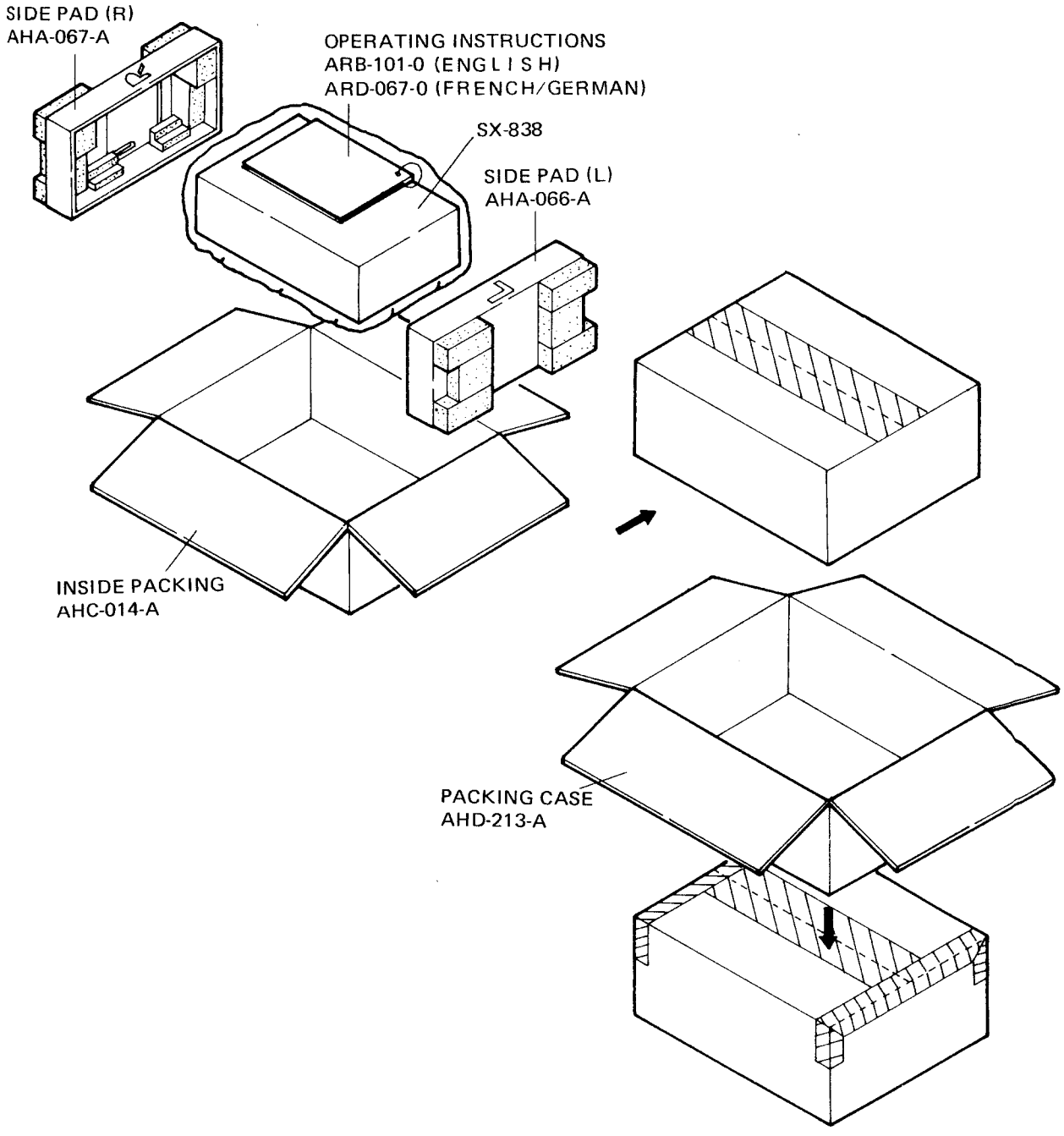
S1	FUNCTION AM	S13	TURN OVER LOW
S2	〃 FM	S14	TURN OVER HIGH
S3	〃 PHONO 1	S15	LOW FILTER
S4	〃 PHONO 2	S16	HIGH FILTER
S5	〃 MIC	S17	AUDIO MUTING
S6	〃 AUX	S18	SPEAKER A
S7	REC SELECTOR	S19	〃 B
S8	TAPE MONITOR 1	S20	〃 C
S9	TAPE MONITOR 2	S21	POWER
S10	NR ADAPTOR	S22	FM MUTING
S11	MODE		
S12	LOUDNESS		

5. CIRCUIT DESCRIPTION

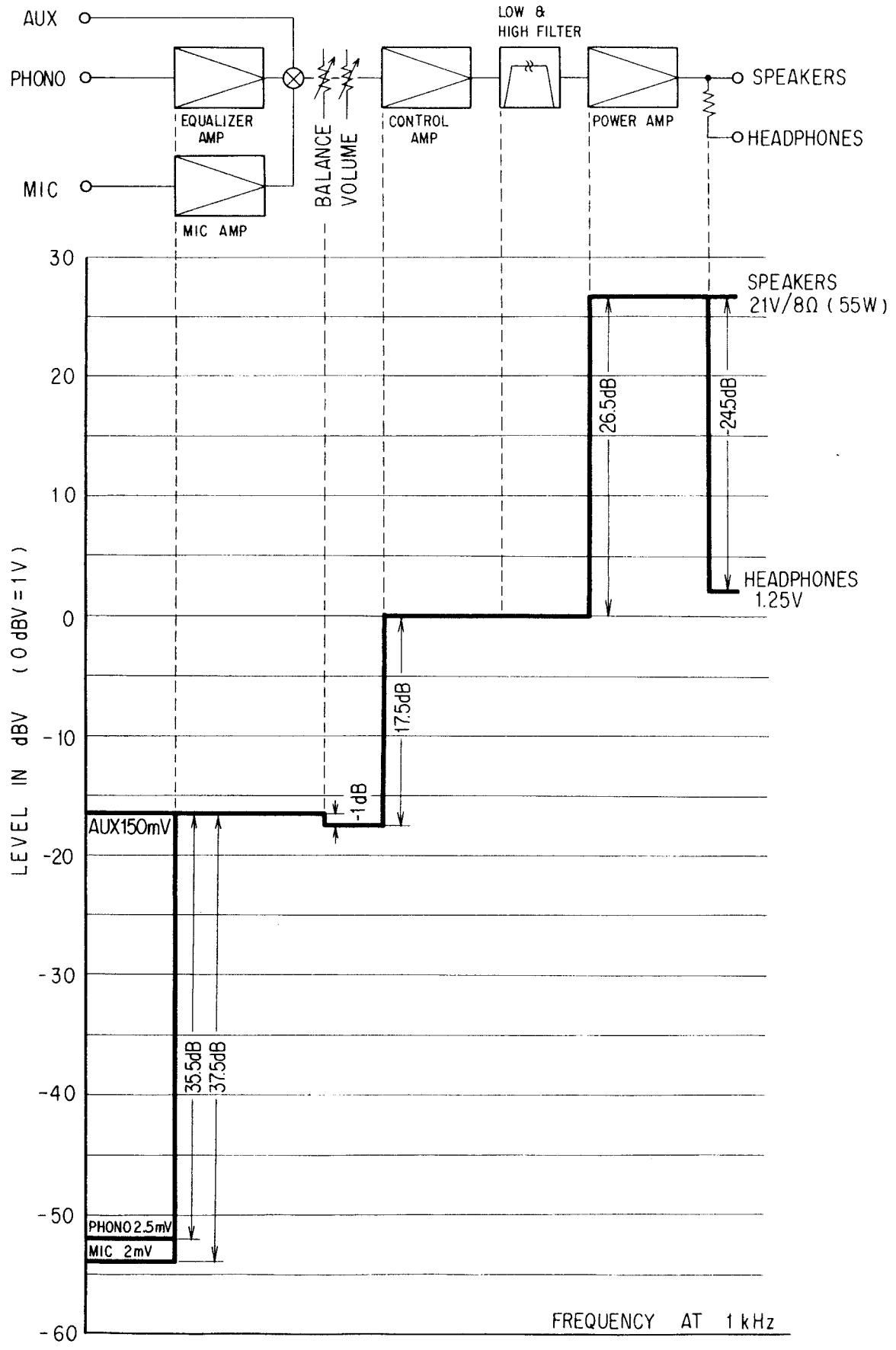
Signal Path

1. The FM broadcast signal waveform from the antenna is fed to the two dual-gate MOS field-effect transistor in the front end section for radio frequency amplification. This signal is converted into an intermediate frequency by the dual-gate MOS FET mixer stage in combination with the signal from the local oscillator.
2. The intermediate frequency signal, converted within the front end section, is fed to three ceramic filters and two ICs, where it is tuned, amplified, and detected, becoming a audio frequency (composite) signal.
   The composite signal following detection is fed to the 4CH MPX terminal jack and the multiplex decoder stage.
3. The multiplex decoder stage uses one IC for three functions: to demodulate the composite signal into the left and right channel stereo signals, to operate the automatic mode switching between stereo/mono, and to switch the stereo indicator lamp appropriately. The decoding system uses a phase locked loop (PLL) circuit, which assures continuous stable operation and excellent stereo separation with low susceptibility to external noise (such as car ignition noise) and ambient temperature changes.
   After decoding, the signal is fed to four transistors and one LC filter, where the residual carrier component (38kHz, 19kHz, and SCA) is rejected, and then to the audio amplifier section.
4. The FM muting circuit is an electronic switch incorporated into the IC, so that the demodulated circuit is switched off and on in the IC.
5. The AM tuner section employs one monolithic IC which functions as radio frequency amplifier, frequency converter; local oscillator, intermediate frequency amplifier, and detector. The output is a pure audio signal.
6. The signals which are applied to the PHONO 1 and 2 terminal jacks are selected by the FUNCTION switch before being fed to the first stage of the three-stage direct-coupled equalizer amplifier by which the signals are amplified.
7. The output from the equalizer amplifier, together with that from the AUX terminal jacks, the audio signal from the AM tuner, the audio signal from the FM tuner, and the amplified signal from MIC terminal jack; are all selected by the FUNCTION switch, and pass through the switch circuits for REC SELECTOR, TAPE MONITOR, DOLBY NR ADAPTOR, and the circuits for BALANCE and VOLUME controls, before being fed to the control amplifier.
8. The control amplifier has an extremely high input impedance, using an field-effect transistor. This greatly reduces the influence of the performance imherent in equipment connected externally.
   The output from this FET circuit is into the tone control circuit, and employed with turn over switches.
9. The control amplifier output is fed to the power amplifier after passing through the LOW FILTER, HIGH FILTER, and AUDIO MUTING circuits.
   The power amplifier is a differential amplifier of the first stage and pure complementary circuit design with balanced positive and negative power supply.
10. The power amplifier output is fed to the three push buttons which form the SPEAKER switch. This selects A, B, and C speaker system terminal connection.
    If all three speaker systems were to be connected simultaneously, the effective speaker impedance might be less than 4Ω. To guard against this possibility, when all three buttons are depressed together, all three systems are disconnected from the amplifier.
11. The protective circuit which guard against DC potentials at the power amplifier output junctions, against speaker complex load impedances less than 4Ω, and shorts across the speaker terminals. Their operation is such that, under the corresponding abnormal condition, a relay acts to separate the output junction and the output circuit. Further, these protective circuits are also help to mute the unwanted signal which immediately follows switching the POWER switch ON, and to immediately disconnect the output after switched OFF.

6. PACKING METHOD AND PART NUMBERS

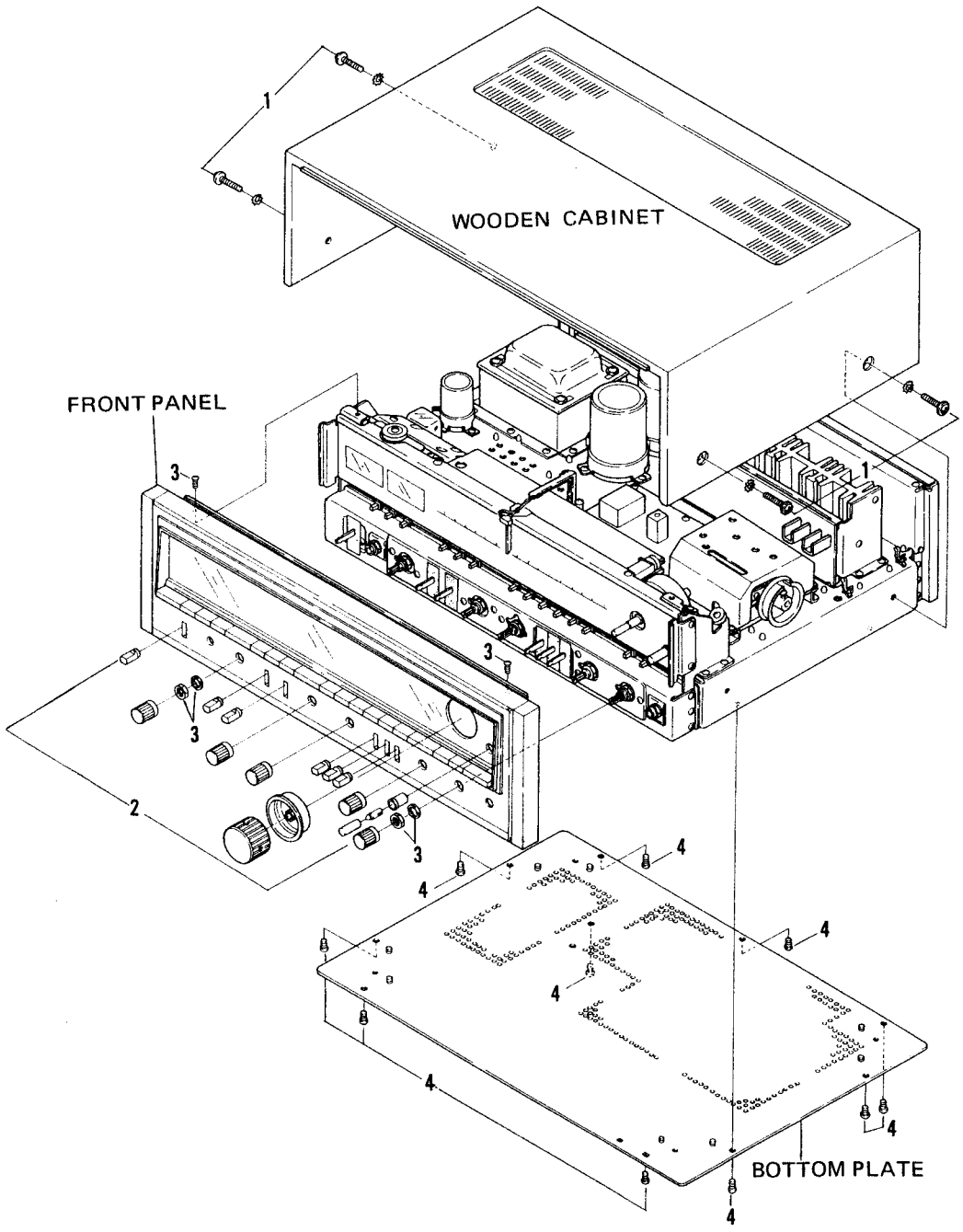


7. LEVEL DIAGRAM



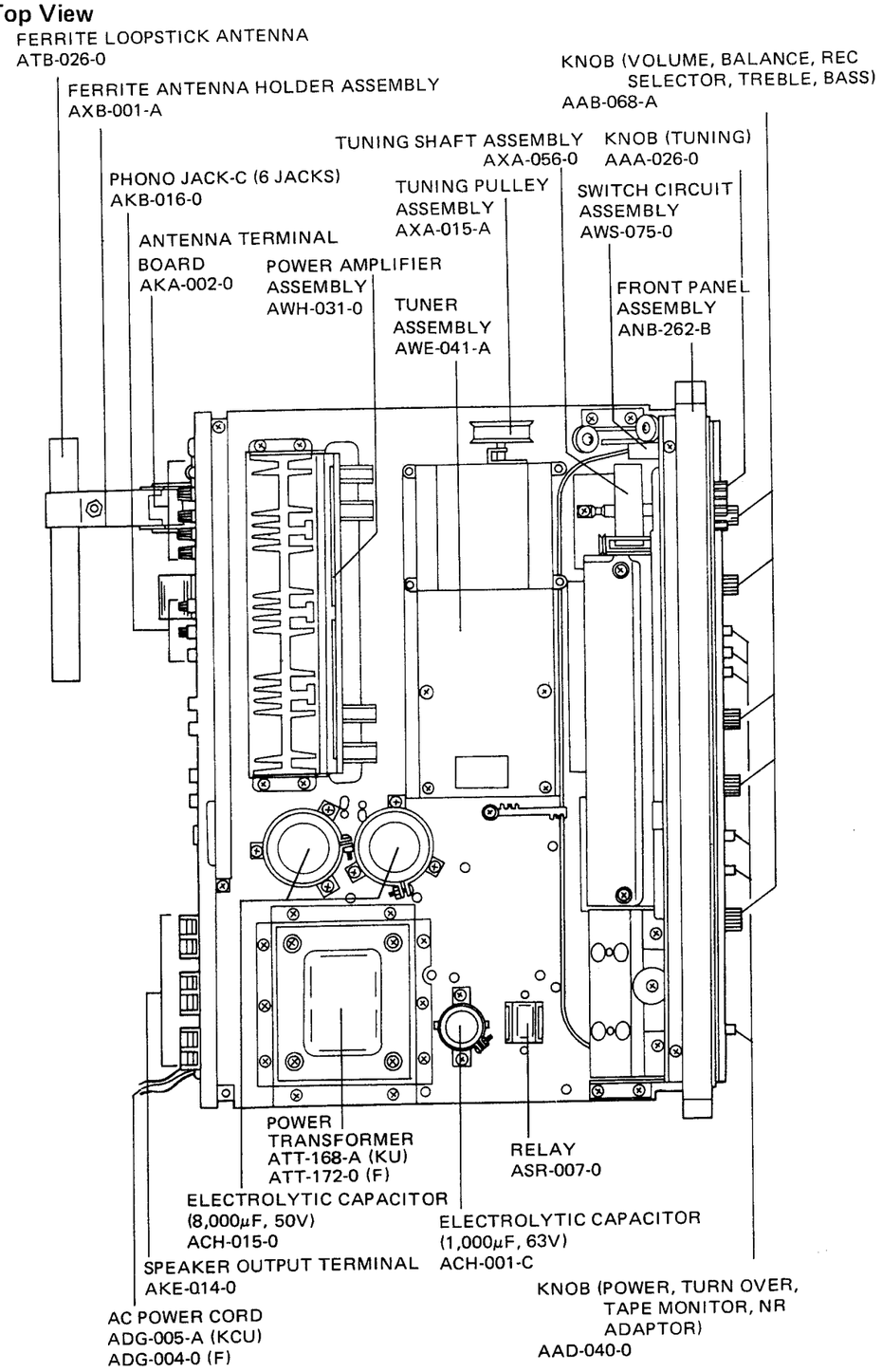
8. DISASSEMBLY

1. To remove the wooden cabinet, first remove the two screws holding each side, then lift the back of the wooden cabinet upward.
2. Pull off all knobs.
3. Remove the two screws in the upper edge of the front panel, and remove two nuts and washers. Then pull the panel gently forward.
4. To remove the bottom panel, first remove the ten screws holding it in place.

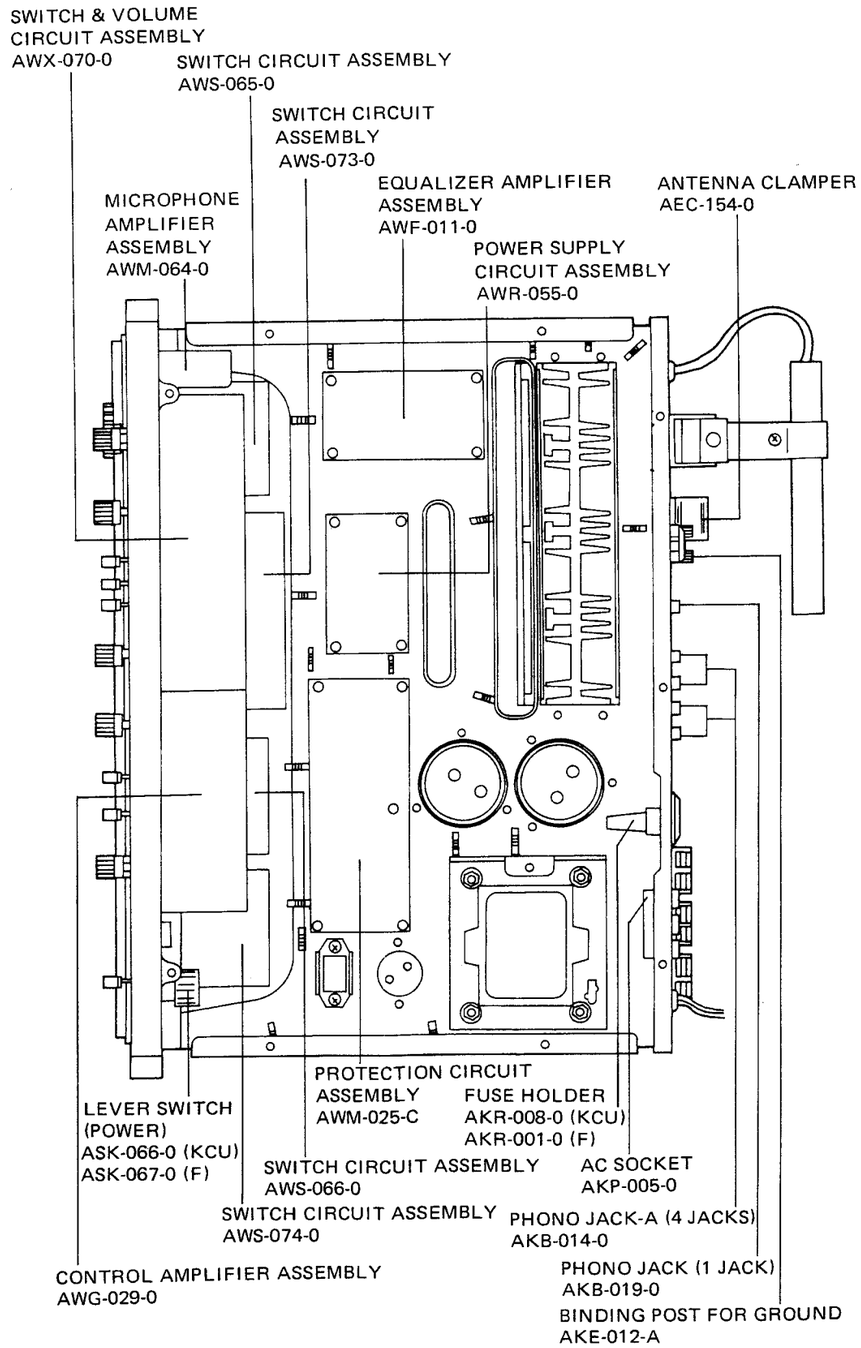


9. PARTS AND P.C. BOARD LOCATIONS

Top View

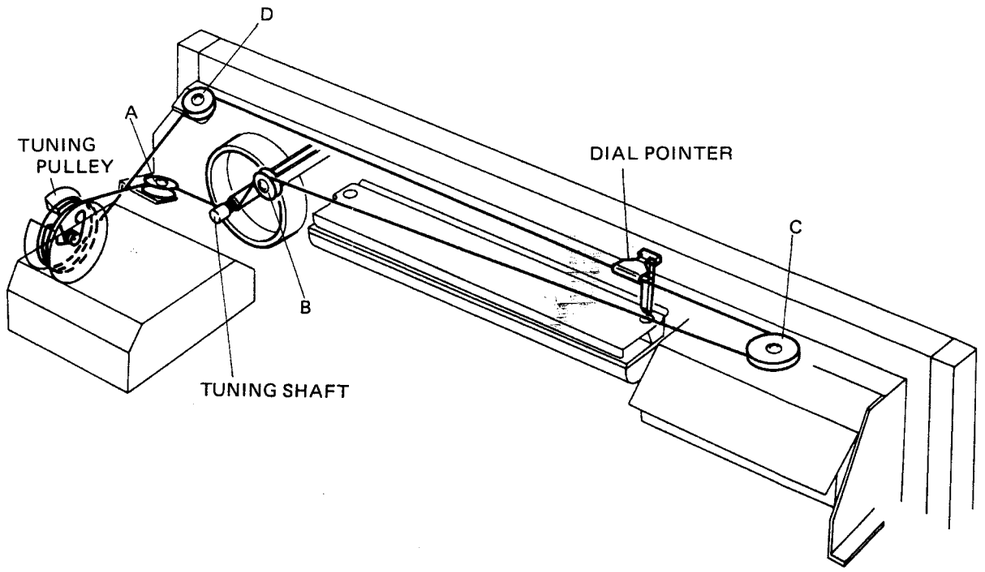


Bottom View



10. DIAL CORD STRINGING

1. Turn the tuning capacitor so that its plates protrude as much as possible.
2. The one end of the string to the spring on the TUNING pulley (attached to the tuning capacitor).
3. Lead the string around pulley A, then wind it three turns around the TUNING shaft.
4. Lead the string around pulleys B, C and D then wind it 1-1/2 turns around the TUNING pulley.
5. Now tie the other end of the string to the spring on the TUNING pulley. Turn the TUNING shaft and check for proper function. Then trim the ends of the string.
6. Turn the TUNING shaft until the plates of the variable are all the way in. Move the pointer to the left-end starting point on the dial and fasten it to the string in that position.



11. ALIGNMENT PROCEDURE

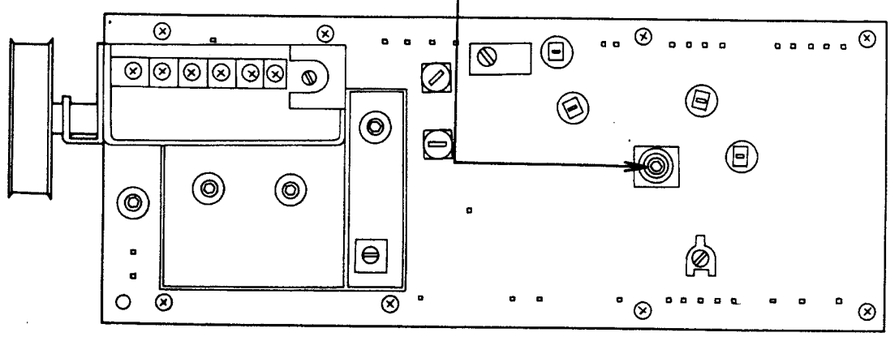
11.1 ENGLISH

Aligning the FM Section

1. SX-838 Control Settings
   Set the controls (knob and switches) of the SX-838 as follows:
   POWER: ON
   FUNCTION: FM
   FM MUTING: OFF
2. Connections between Test Equipment and the SX-838.

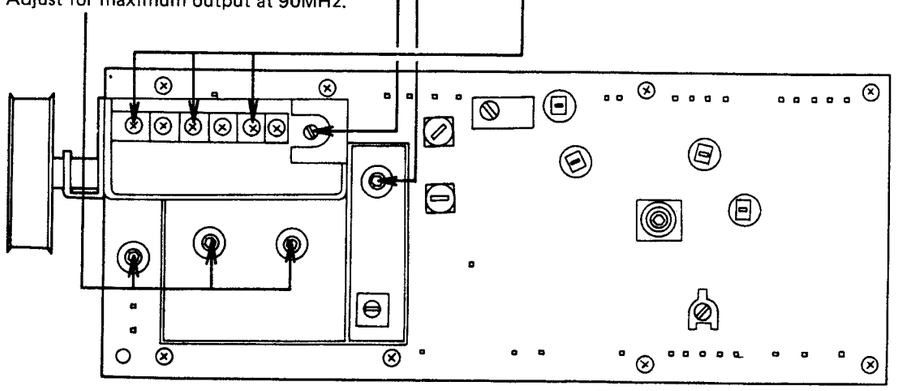
- The output from an FM signal generator should be connected to the 300Ω antenna terminals of the SX-838.
- A distortion meter should be connected to the TAPE REC terminal jacks on the SX-838.
- An AC millivolt meter should be connected to the TAPE REC terminal jacks on the SX-838 in parallel with the distortion meter.

3. Set both the FM signal generator and the SX-838 to indicate 98MHz.
4. Turn the FM signal generator output level down to minimum
5. Turn the lower core and adjust so that the TUNING meter needle is centered.
6. Increase the FM signal generator output to 60dB, modulated at 400Hz, with a deviation of ±75kHz.
7. Turn the upper core and adjust so that the distortion is at a minimum. Steps 4~above should be repeated several times in succession, until no further significant improvement is obtained.



TUNER ASSEMBLY (AWE-041)

8. Set the FM signal generator output level to 10dB, modulated at 400Hz, with a frequency deviation of ±75kHz.
9. Adjust for maximum output at 90MHz.
10. Adjust for maximum output at 106MHz.
11. Adjust for maximum output at 90MHz.
12. Adjust for maximum output at 106MHz. Steps 11~12 above should be repeated several times in succession, until no further significant improvement is obtained.

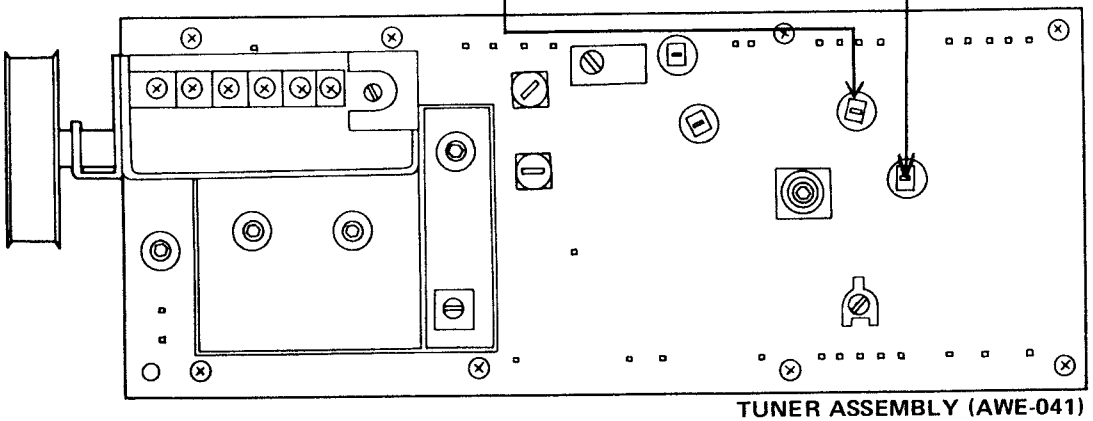


TUNER ASSEMBLY (AWE-041)

Aligning the FM MPX Section

NOTES:
This set of adjustments should not be carried out until the alignment of the FM section (1~12 above) has been completed:
The multiplex signal generator should be connected to the external modulator terminals of the FM signal generator.

1. SX-838 Control Settings
   Set the controls (knob and switches) of the SX-838 as follows:
   POWER: ON
   FUNCTION: FM
   FM MUTING: OFF
2. Connections between the Test Equipment and the SX-838.
   - The output from the FM signal generator should be connected to the 300Ω antenna terminals of the SX-838.
   - The output from the MPX signal generator should be connected to the external modulator terminals of the FM signal generator.
   - The oscilloscope X plates (horizontal inputs) should be connected to the PILOT OUT terminals on the MPX signal generator, and the Y plates (vertical inputs) to terminal number 18.
   - The AC millivolt meter should be connected to the TAPE REC terminals (with changeover possible from L to R channels).
3. Multiplex Signal Generator Modulation
   L + R (1kHz): 67.5kHz deviation
   PILOT (19kHz): 7.5kHz deviation
4. Set the FM signal generator output to minimum.
5. Adjust for a stationary Lissajous waveform on the oscilloscope.
6. Reset the FM signal generator to 60dB level output.
   And modulate either the L or R channel.
7. Adjust for the maximum separation.

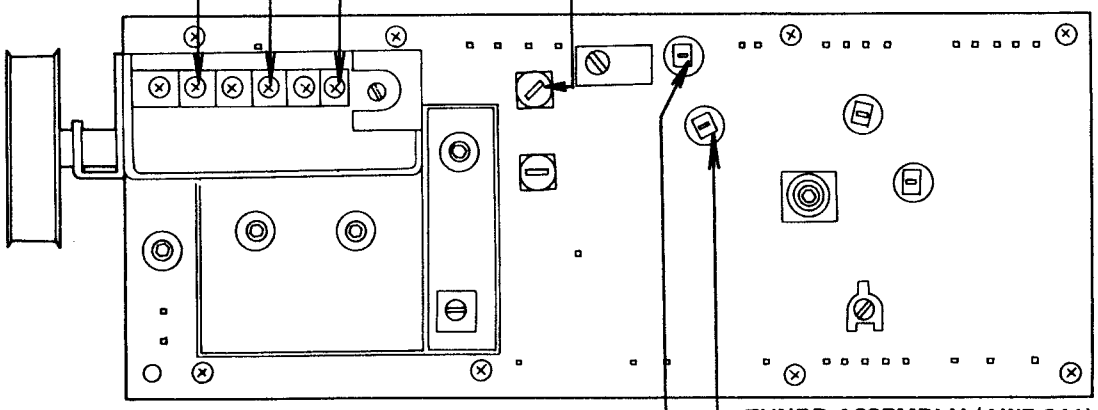


TUNER ASSEMBLY (AWE-041)

Aligning the AM Section

1. SX-838 Control Settings
   Set the controls (knob and switch) of the SX-838 as follows:
   POWER: ON
   FUNCTION: AM
2. Connections between Test Equipment and the SX-838
- Connect the AM signal generator to the AM antenna terminals (in series with a 1kΩ dummy resistor).
- Connect the AC millivolt meter to the TAPE REC terminal jacks.

3. Set the AM signal generator to 30% modulation at 400Hz.
4. Set the AM signal generator output to 30dB at 600kHz.
   Adjust for maximum output (Carry out the ferrite loopstick antenna core adjustment at the same time).
5. Adjust for maximum output with the frequency set at 1,400kHz.
   Adjustments 4~5 above should be repeated several times until no further significant improvement is obtained.
6. Connect the AM signal generator directly to the AM ANT (antenna) terminals.

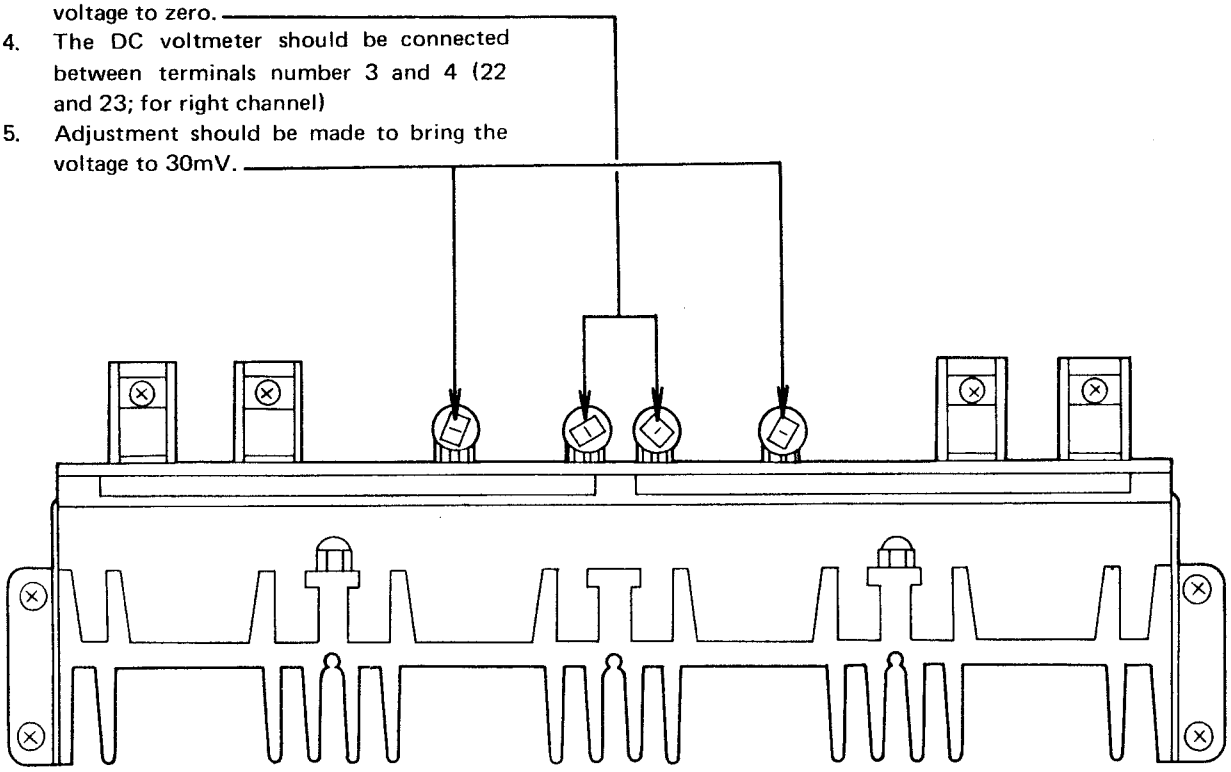


TUNER ASSEMBLY (AWE-041)

7. With a frequency of 1,400kHz and an AM signal generator output of 36dB, adjust for a low frequency output of 70mV.
8. With an AM signal generator output of 80dB, adjust for a low frequency output of 310mV.

Aligning the Power Amplifier Section

1. Nothing should be connected to the input jacks of the SX-838, and an 8Ω dummy resistor should be connected across the speaker terminals.
2. A DC millivolt meter should be connected across between terminal number 5 and earth (20 and earth; for right channel)
3. Adjustment should be made to bring the voltage to zero.
4. The DC voltmeter should be connected between terminals number 3 and 4 (22 and 23; for right channel)
5. Adjustment should be made to bring the voltage to 30mV.



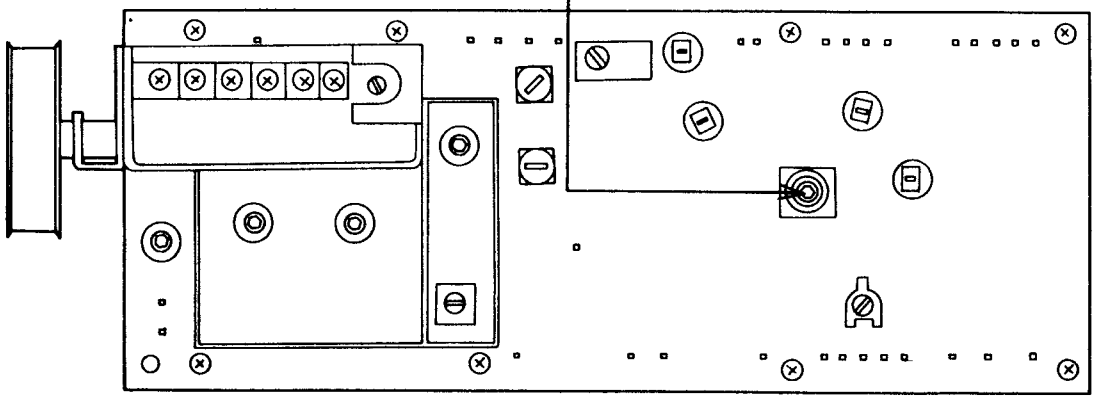
POWER AMPLIFIER ASSEMBLY (AWH-031)

11.2 German

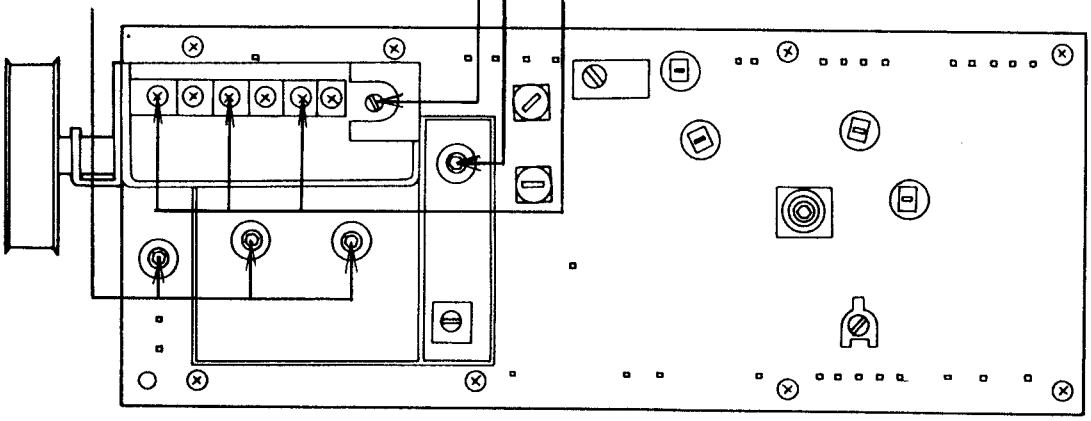
ABGLEICHVERFAHREN

Abgleichen Des FM-Teils

1. Regeleinstellungen am SX-838
   Die Steuerelemente (Knöpfe und Schalter) des SX-838 sind wie folgt einzustellen:
   POWER (Stromzuführung): ON (Ein)
   FUNCTION (Funktion): FM
   FM MUTING (FM-Dämpfung): OFF (Aus)
2. Schaltungen zwischen Prüfsatz und dem SX-838.
   - Der Ausgang von einem FM-Prüfsender ist mit den 300-Ohm-Antennenanschlüssen des SX-838 zu verbinden.
   - Ein Klirrfaktormeßgerät ist mit den Anschlußbuchsen des SX-838 TAPE REC (Band-aufnahme) zu verbinden.
   - Ein Millivolt-Wechselspannungsmesser ist parallel zum Klirrfaktormeßgerät mit den Anschlußbuchsen TAPE REC (Band-aufnahme) des SX-838 zu verbinden.
3. Der FM-Prüfsender und der SX-838 sind beide auf eine Anzeige von 98 MHz einzustellen.
4. Der Ausgangspegel des FM-Prüfsenders ist auf minimale Einstellung herunterzudrehen.
5. Der untere Kern ist zu drehen und so einzustellen, daß die Nadel des Abstimm-Meters zentriert ist.
6. Der Ausgang des FM-Prüfsenders ist moduliert bei 400 Hz bei einer Abweichung von ±75 kHz auf 60 dB zu erhöhen.
7. Der obere Kern ist zu drehen und so einzustellen, daß die Verzerrung minimal wird. Obige Schritte 4 — 7 sollen mehrmals nacheinander wiederholt werden, bis keine merkliche Verbesserung erzielt wird.



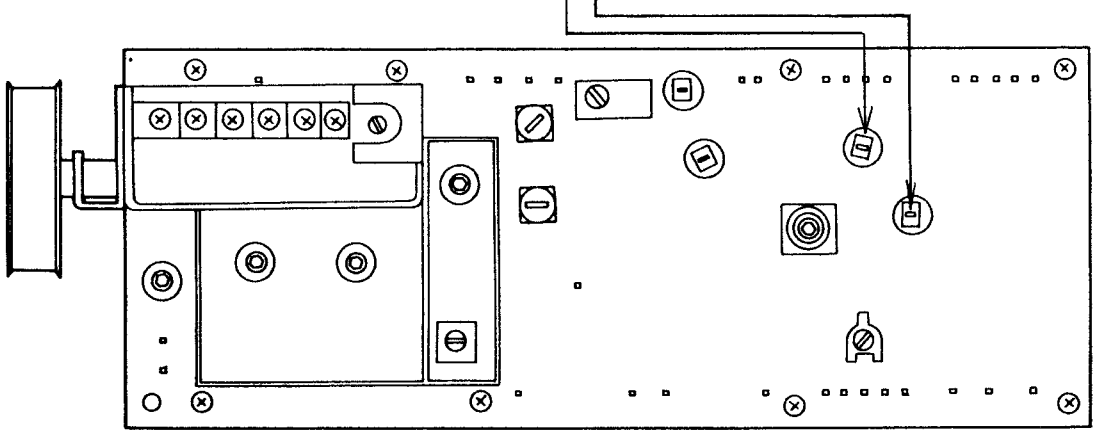
8. Der Ausgangspegel des FM-Prüfsenders ist, moduliert bei 400 Hz bei einer Frequenzabweichung von ±75 kHz, auf 10 dB einzustellen.
9. Es ist auf maximalen Ausgang bei 87,4 MHz einzustellen.
10. Es ist auf maximalen Ausgang bei 106 MHz einzustellen.
11. Es ist auf maximalen Ausgang bei 90 MHz einzustellen.
12. Es ist auf maximalen Ausgang bei 106 MHz einzustellen.
    Obige Schritte 11 — 12 sind mehrfach nacheinander zu wiederholen, bis keine weitere merkliche Verbesserung erzielt wird.



Abgleichen Des FM-MPX-Teils

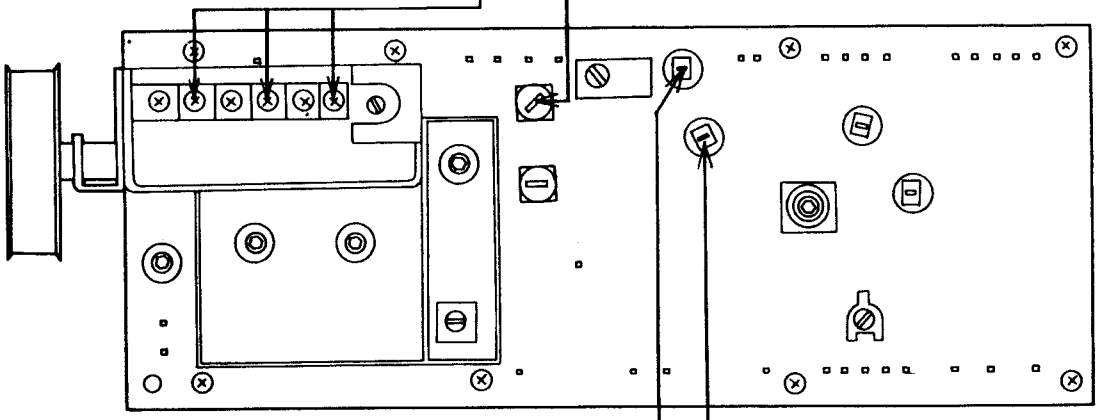
Zur Beachtung: Die folgenden Einstellschritte sollten nicht vor Beendigung des Abgleichs des FM-Teils (siehe oben 1 — 12) durchgeführt werden.
Der Multiplex-Prüfsender ist mit den Außenmodulatoranschlüssen des FM-Prüfsenders zu verbinden.

1. Regeleinstellungen am SX-838
   Die Steuerelemente (Knöpfe und Schalter) des SX-838. sind wie folgt einzustellen:
   POWER (Stromzuführung): ON (Ein)
   FUNCTION (Funktion): FM (UKW)
   FM MUTING (FM-Dämpfung): OFF (Aus)
2. Schaltungen zwischen Prüfsatz und dem SX-838.
   - Der Ausgang vom FM-Prüfsender ist mit den 300-Ω-Antennenanschlüssen des SX-838 zu verbinden.
   - Der Ausgang vom MPX-Prüfsender ist an die Außenmodulatoranschlüsse des FM-Prüfsenders anzuschließen.
   - Die x-Anoden des Oszilloskops sind mit den Anschlüssen PILOT OUT am MPX-Prüfsender und die y-Anoden mit dem Anschluß 18 zu verbinden.
   - Der Millivolt-Wechselspannungsmesser ist mit den TAPE REC (Band/Aufnahme)-Anschlüssen (mit Umschaltmöglichkeit von den Kanälen LH auf RH) zu verbinden.
3. Modulation des Multiplex-Prüfsenders
   L+R (1 kHz): Abweichung von 67,5kHz
   PILOT (19 kHz): Abweichung von 7,5kHz
4. Der Ausgang des FM-Prüfsenders ist auf minimales Niveau einzustellen.
5. Am Oszilloskop ist eine Einstellung auf eine stehende Wellenform der Lissajousschen Figur durchzuführen.
6. Der FM-Prüfsender ist auf einen Pegelausgang von 60 dB zurückzustellen und entweder der LH- oder der RH- Kanal zu modulieren.
7. Es ist auf maximale Trennung einzustellen.



Abgleichen Des AM-Teils

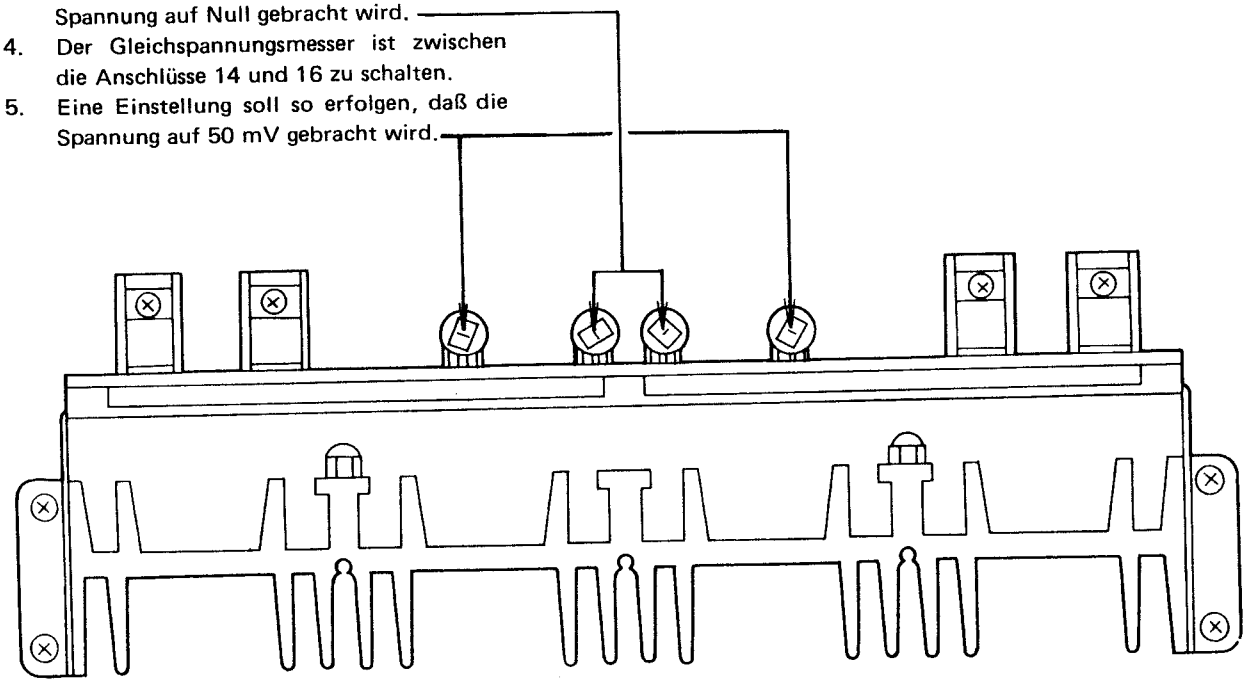
1. Regeleinstellungen am SX-838
   Die Steuerelemente (Knöpfe und Schalter) des SX-838 sind wie folgt einzustellen:
   POWER (Stromzuführung): ON (Ein)
   FUNCTION (Funktion): AM
2. Schaltungen zwischen Prüfsatz und dem SX-838.
   - Der AM-Prüfsender ist mit den AM-Antennenanschlüssen (in Reihenschaltung mit einem künstlichen Widerstand von 1 kΩ) zu verbinden.
   - Der Millivolt-Wechselspannungsmesser ist mit den Anschlußbuchsen TAPE REC (Band-aufnahme) zu verbinden.
3. Der AM-Prüfsender ist auf eine Modulation von 30% bei 400 Hz einzustellen.
4. Der Ausgang des AM-Prüfsenders ist auf 30 dB bei 600 kHz einzustellen. Es ist der maximale Ausgang bei gleichzeitiger Einstellung des Ferritstabantennenkerns einzustellen.
5. Es ist der maximale Ausgang bei einer Frequenzeinstellung auf 1400 kHz einzustellen. Obige Einstellungen 4 – 5 sind mehrfach zu wiederholen, bis keine weitere merkliche Verbesserung erzielt wird.
6. Der AM-Prüfsender ist direkt mit den Anschlüssen AM ANT (Antenne) zu verbinden.



7. Bei einer Frequenz von 1400 kHz und einem Ausgang des AM-Prüfsenders von 36 dB ist auf einen Niederfrequenzausgang von -21 dBs (70 mV) einzustellen.
8. Bei einem Ausgang des AM-Prüfsenders von 80 dB ist eine Einstellung auf einen Niederfrequenzausgang von -12 dBs (310 mV) durchzuführen.

Abgleichen Der Endverstärkerstufe

1. Es ist nihhts an die Eingangsbuchsen des SX-838 anzuschließen; ein küstlicher Widerstand von 8 Ω ist über die Lautsprecheranschlüsse anzulegen.
2. Ein Millivolt-Gleichspannungsmesser ist zwischen Anschluß 19 und Erde zu schalten.
3. Eine Einstellung soll so erfolgen, daß die Spannung auf Null gebracht wird.
4. Der Gleichspannungsmesser ist zwischen die Anschlüsse 14 und 16 zu schalten.
5. Eine Einstellung soll so erfolgen, daß die Spannung auf 50 mV gebracht wird.



12. EXPLODED VIEW AND PARTS LIST

NOTE:
Parts number is subject to change for the purpose of improvement with notice of a service bulletin.
Service bulletin will be furnished whenever necessary and you are requested to amend parts number in this manual according to the instructions.

NOTICE: Any parts asterisked (*) are subject to being not supplied.

Parts List of Exploded View-1

Key No.	Description	Part No.	
1	Power transformer	ATT-168-A	KCU
	Power transformer	ATT-172-0	F
	Power transformer	ATT-181-0	GN
2*	Sub-chassis	ANF-235-A	
3	Electrolytic capacitor 1,000μF 63V	ACH-001-C	
4	Electrolytic capacitor 8,000μF 50V	ACH-015-0	
5*	Chassis	ANA-066-E	
6*	Wire supporter	AEC-084-C	
7	Foot	AEC-027-0	
8*	Bottom plate	ANE-057-B	
9*	Wire clip B	AEC-005-0	
10	Relay	ASR-007-0	
11*	Wire clip A	AEC-004-0	
12	Ground terminal strip	K13-047-0	
13*	P.C. board holder	AEB-019-0	
14	Protection circuit assembly	AWM-025-C	
15	Power supply circuit assembly	AWR-055-A	KCU, F
	Power supply circuit assembly	AWR-064-0	GN
16	Equalizer amplifier assembly	AWF-011-0	
17*	Shield plate	ANF-250-0	
18*	Wire clip	AEC-064-0	
19	Power amplifier assembly	AWH-031-A	
20	Ground terminal strip (2P)	K13-048-0	
21*	Wire clip C	AEC-007-0	
22*	Shield cover	ANF-240-A	
23	Tuner assembly	AWE-041-A	
24	Tuning pulley assembly	AXA-015-A	
25*	P.C. board-held metal (A)	ANF-237-A	
26*	P.C. board-held metal (B)	ANF-238-A	
27	Wooden cabinet	AMM-035-B	
28	Screw M4X26	ABA-011-A	
29	Washer	B21-011-0	

Parts List of Tuner Assembly (AWE-041-A)

RESISTORS AND POTENTIOMETERS

Symbol	Description		Part No.	
R1	Carbon film	1M	RD¼PS 105J	
R2	Carbon film	1.8k	RD¼VS 182J	
R3	Carbon film	5.6k	RD¼PS 562J	
R4	Carbon film	27	RD¼VS 270J	
R5	Carbon film	150	RD¼VS 151J	
R6	Carbon film	12k	RD¼PS 123J	
R7	Carbon film	220k	RD¼VS 224J	
R9	Carbon film	22	RD¼VS 220J	
R10	Carbon film	150	RD¼PS 151J	
R11	Carbon film	4.7k	RD¼VS 472J	
R12	Carbon film	10k	RD¼VS 103J	
R13	Carbon film	1k	RD¼VS 102J	
R14	Carbon film	1k	RD¼VS 102J	
R15	Carbon film	22	RD¼VS 220J	
R16	Carbon film	100	RD¼PS 101J	
R17	Carbon film	100	RD¼PS 101J	
R18	Carbon film	330	RD¼PS 331J	
R19	Carbon film	330	RD¼PS 331J	
R20	Carbon film	560k	RD¼PS 564J	
R21	Carbon film	330	RD¼PS 331J	
R22	Carbon film	12k	RD¼PS 123J	
R23	Carbon film	220k	RD¼VS 224J	
R24	Carbon film	10k	RD¼PS 103J	
R25	Carbon film	330	RD¼PS 331J	
R26	Carbon film	2.4k	RD¼VS 242J	
R27	Carbon film	16k	RD¼PS 163J	
R28	Carbon film	2.2k	RD¼PS 222J	
R29	Carbon film	47k	RD¼PS 473J	
R30	Carbon film	100k	RD¼PS 104J	
R31	Carbon film	5.6k	RD¼PS 562J	
R32	Carbon film	5.6k	RD¼PS 562J	
R33	Carbon film	15k	RD¼VS 153J	
R36	Carbon film	150	RD¼PS 151J	
R37	Carbon film	3.3k	RD¼VS 332J	
R38	Carbon film	10	RD¼VS 100J	
R39	Carbon film	10	RD¼PS 100J	
R40	Carbon film	100k	RD¼PS 104J	
R41	Carbon film	10	RD¼PS 100J	
R42	Carbon film	10	RD¼PS 100J	
R43	Carbon film	3.3k	RD¼PS 332J	
R44	Carbon film	3.3k	RD¼PS 332J	
R45	Carbon film	1.8k	RD¼PS 182J	
R46	Carbon film	1.8k	RD¼PS 182J	
R47	Carbon film	18k	RD¼PS 183J	
R48	Carbon film	18k	RD¼PS 183J	
R49	Carbon film	3.9k	RD¼PS 392J	

Continued on the Next Page

Symbol	Description		Part No.	
R50	Carbon film	3.9k	RD¼PS 392J	
R51	Carbon film	3.9k	RD¼PS 392J	
R52	Carbon film	3.9k	RD¼PS 392J	
R53	Carbon film	1.2k	RD¼PS 122J	
R54	Carbon film	1.2k	RD¼PS 122J	
R55	Carbon film	220k	RD¼PS 224J	
R56	Carbon film	220k	RD¼PS 224J	
R57	Carbon film	47	RD¼PS 470J	
R58	Carbon film	47k	RD¼PS 473J	
R59	Carbon film	47k	RD¼PS 473J	
R60	Carbon film	3.3k	RD¼PS 332J	
R61	Carbon film	22k	RD¼PS 223J	
R62	Carbon film	680	RD¼PS 681J	
R63	Carbon film	1k	RD¼PS 102J	
R64	Carbon film	2.2k	RD¼PS 222J	
R65	Carbon film	100	RD¼PS 101J	
R66	Carbon film	47	RD¼PS 470J	
R67	Carbon film	24k	RD¼PS 243J	
VR1	Variable resistor, semi-fixed	4.7k-B	C92-051-0	
VR2	Variable resistor, semi-fixed	330k-B	ACP-042-0	
VR3	Variable resistor, semi-fixed	50k-B	ACP-043-0	
VR4	Variable resistor, semi-fixed	47k-B	C92-048-0	
VR5	Variable resistor, semi-fixed	2.2k-B	ACP-001-0	

CAPACITORS

Symbol	Description			Part No.	
VC	Tuning Capacitor			ACK-006-0	
TC4	Ceramic Trimmer			C43-007-A	
C1	Ceramic	15p	50V	CCDSH 150K 50	
C2	Ceramic	100p	50V	CCDSL 101K 50	
C3	Ceramic	0.01	50V	CKDYF 103Z 50	
C4	Ceramic	0.01	50V	CKDYF 103Z 50	
C5	Ceramic	2p	50V	CCDSL 020C 50	
C6	Ceramic	0.01	50V	CKDYF 103Z 50	
C7	Ceramic	18p	50V	CCDSH 180K 50	
C8	Ceramic	0.01	50V	CKDYF 103Z 50	
C9	Ceramic	18p	50V	CCDSH 180K 50	
C10	Ceramic	100p	50V	CCDSL 101K 50	
C11	Ceramic	10p	50V	CCDSL 100F 50	
C12	Ceramic	0.01	50V	CKDYF 103Z 50	
C13	Ceramic	0.01	50V	CKDYB 103K 50	
C14	Ceramic	8p	50V	CCDLH 080F 50	
C15	Ceramic	15p	50V	CCDLH 150K 50	

Symbol	Description			Part No.	
C16	Ceramic	33p	50V	CCDCH 330K 50	
C17	Ceramic	15p	50V	CCDCH 150K 50	
C18	Ceramic	0.01	50V	CKDYF 103Z 50	
C19	Ceramic	0.01	50V	CKDYF 103Z 50	
C20	Ceramic	0.047	25V	CKDBC 473Z 25	
C21	Ceramic	0.047	25V	CKDBC 473Z 25	
C22	Electrolytic	4.7	25V	CEA 4R7P 25	
C23	Ceramic	33p	50V	CCDSL 330K 50	
C24	Electrolytic	10	16V	CEA 100P 16	
C25	Electrolytic	0.47	50V	CEA R47P 50	
C26	Electrolytic	10	16V	CEA 100P 16	
C27	Ceramic	0.047	25V	CKDBC 473Z 25	
C28	Ceramic	0.047	25V	CKDBC 473Z 25	
C29	Ceramic	0.047	25V	CKDBC 473Z 25	
C30	Ceramic	0.047	25V	CKDBC 473Z 25	
C31	Electrolytic	1	50V	CEA 010P 50	
C32	Ceramic	150p	50V	CCDSL 151K 50	
C33	Electrolytic	100	16V	CEA 101P 16	
C34	Electrolytic	47	16V	CEA 470P 16	
C35	Mylar	0.047	50V	CQMA 473K 50	
C36	Styrol	510p	50V	CQSH 511J 50	
C37	Electrolytic	0.33	25V	CSSA R33M 25	
C38	Electrolytic	1	10V	CSSA 010M 10	
C39	Electrolytic	0.47	25V	CSSA R47M 25	
C40	Mylar	0.0082	50V	CQMA 822J 50	
C41	Mylar	0.0082	50V	CQMA 822J 50	
C42	Electrolytic	100	16V	CEA 101P 16	
C43	Electrolytic	2.2	25V	CEA 2R2P 25	
C44	Electrolytic	2.2	25V	CEA 2R2P 25	
C45	Electrolytic	0.47	50V	CEA R47P 50	
C46	Electrolytic	0.47	50V	CEA R47P 50	
C47	Ceramic	0.04	50V	CKDYF 403Z 50	
C48	Ceramic	8p	50V	CCDXL 080F 50	
C49	Styrol	300p	50V	CQSA 301J 50	
C50	Mylar	0.01	50V	CQMA 103K 50	
C51	Ceramic	0.04	50V	CKDYF 403Z 50	
C52	Electrolytic	4.7	25V	CEA 4R7P 25	
C53	Electrolytic	47	6V	CEA 470P 6	
C54	Ceramic	220p	50V	CCDSL 221K 50	
C55	Ceramic	0.01	50V	CKDYF 103Z 50	
C56	Ceramic	0.01	50V	CKDYF 103Z 50	
C57	Ceramic	0.005	50V	CKDYF 502Z 50	
C58	Electrolytic	10	16V	CEA 100P 16	
C59	Ceramic	0.04	50V	CKDYF 403Z 50	
C60	Electrolytic	0.1	25V	CSSA 0R1M 25	
C61	Ceramic	0.01	50V	CKDYB 103K 50	
C62	Ceramic	0.01	50V	CKDYB 103K 50	
C63	Electrolytic	220	16V	CEA 221P 16	
C64	Ceramic	0.005	50V	CKDYF 502Z 50	

Continued on the Next Page

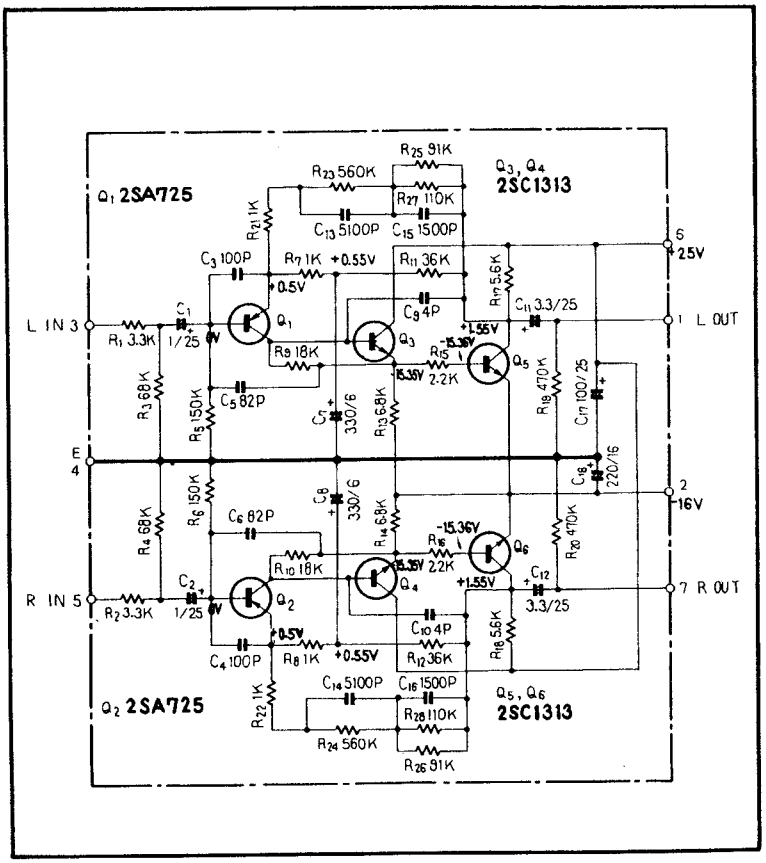
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	FET	3SK45-B		
Q2	FET	3SK45-B		
Q3	Transistor	2SC717		
Q4	Transistor	2SC461-B		
Q5	IC	HA1201		
Q6	IC	HA1137		
Q7	IC	HA1138		
Q8	IC	HA1156		
Q10	Transistor	2SC945-Q, R or S		
Q11	Transistor	2SA763P-6 or 5 (2SA725-F or G)		
Q12	Transistor	2SA763P-6 or 5 (2SA725-F or G)		
Q13	Transistor	2SC945-Q, R or S		
Q14	Transistor	2SC945-Q, R or S		
D1	Diode	1S2076		
D2	Diode	1S2076		

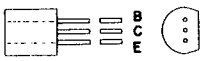
COILS, FILTERS AND TRANSFORMERS

Symbol	Description	Part No.	
T1	FM antenna coil	ATC-021-0	
T2	FM RF coil	ATC-015-0	
T3	FM RF coil	ATC-016-0	
T4	FM OSC coil	ATC-022-0	
T5	FM matching transformer	ATE-008-0	
T6	FM IF transformer	T73-035-A	
T7	AM RF coil	ATB-014-0	
T8	AM OSC coil	ATB-013-0	
F1	FM ceramic filter	ATF-013-B	
F2	FM ceramic filter	ATF-013-B	
F3	FM ceramic filter	ATF-013-B	
F4	AM ceramic filter	ATF-009-0	
F5	Low pass filter	ATF-019-0	
L1	Choke coil	ATH-007-0	
L2	RF choke coil	T24-028-A	
L3	RF choke coil	T24-028-A	
L4	RF choke coil	T24-028-A	
L5	RF choke coil	T24-028-A	

13. 3 EQUALIZER AMPLIFIER ASSEMBLY (AWF-011-0)

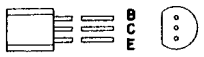


2SA725
2SC1313

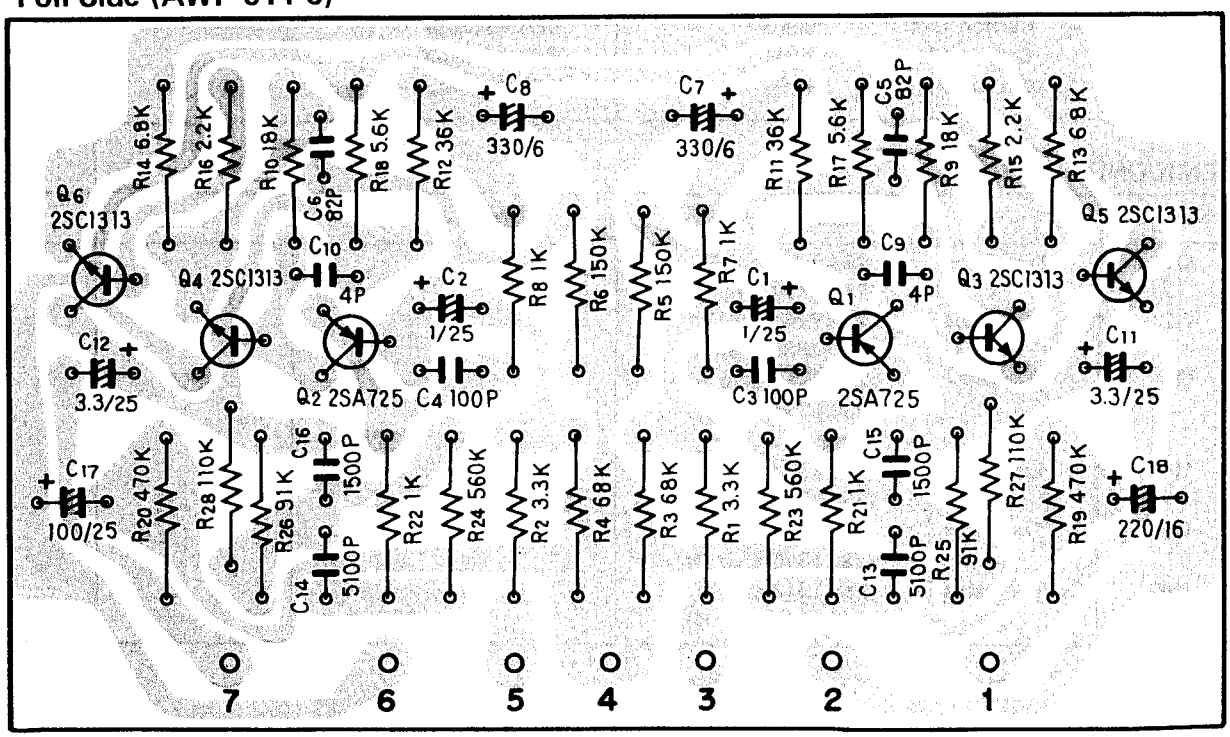


2SC1345

2SA763P



Foil Side (AWF-011-0)



Parts List of Equalizer Amplifier Assembly

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	3.3k	RD¼PS 332J	
R2	Carbon film	3.3k	RD¼PS 332J	
R3	Carbon film	68k	RD¼PS 683J	
R4	Carbon film	68k	RD¼PS 683J	
R5	Carbon film	150k	RD¼PS 154J	
R6	Carbon film	150k	RD¼PS 154J	
R7	Carbon film	1k	RD¼PS 102J	
R8	Carbon film	1k	RD¼PS 102J	
R9	Carbon film	18k	RD¼PS 183J	
R10	Carbon film	18k	RD¼PS 183J	
R11	Carbon film	36k	RD¼PS 363J	
R12	Carbon film	36k	RD¼PS 363J	
R13	Carbon film	6.8k	RD¼PS 682J	
R14	Carbon film	6.8k	RD¼PS 682J	
R15	Carbon film	2.2k	RD¼PS 222J	
R16	Carbon film	2.2k	RD¼PS 222J	
R17	Carbon film	5.6k	RD¼PS 562J	
R18	Carbon film	5.6k	RD¼PS 562J	
R19	Carbon film	470k	RD¼PS 474J NL	
R20	Carbon film	470k	RD¼PS 474J NL	
R21	Carbon film	1k	RD¼PS 102J	
R22	Carbon film	1k	RD¼PS 102J	
R23	Carbon film	560k	RD¼PS 564J NL	
R24	Carbon film	560k	RD¼PS 564J NL	
R25	Carbon film	91k	RD¼PS 913J	
R26	Carbon film	91k	RD¼PS 913J	
R27	Carbon film	110k	RD¼PS 114J	
R28	Carbon film	110k	RD¼PS 114J	

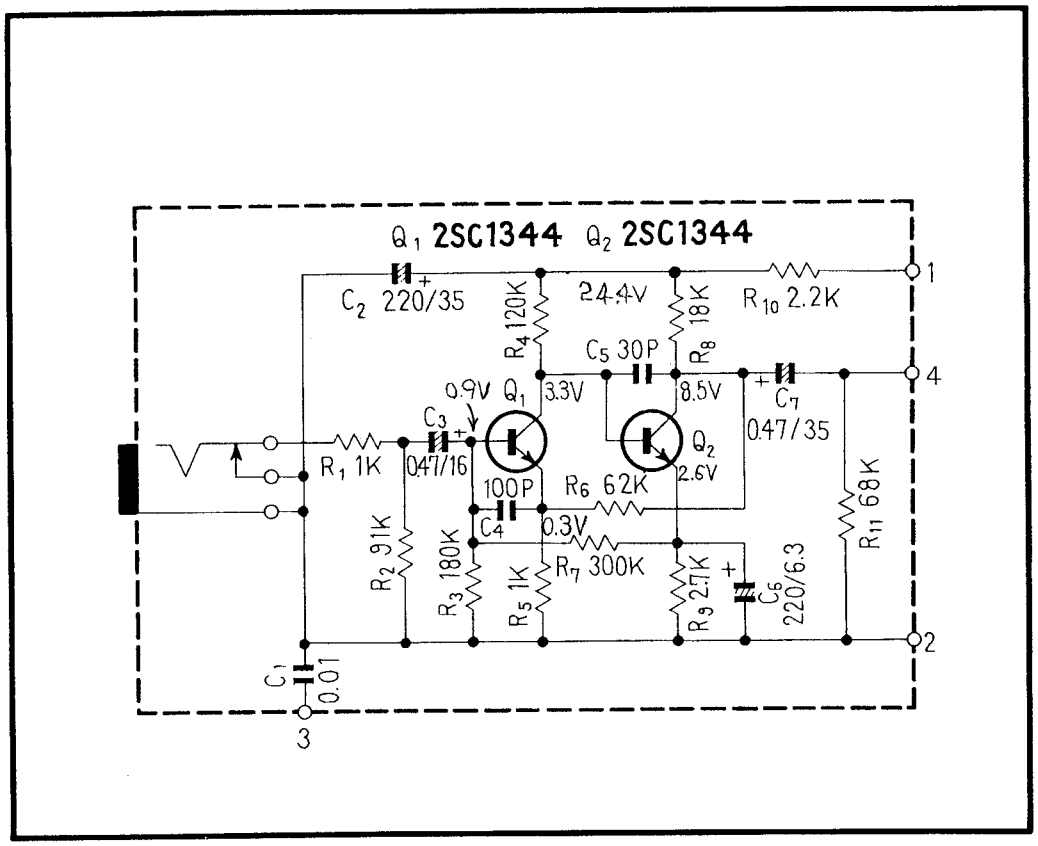
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SA725-F or G (2SA763P-5 or 6)		
Q2	Transistor	2SA725-F or G (2SA763P-5 or 6)		
Q3	Transistor	2SC1313-G or F (2SC1345-E or D)		
Q4	Transistor	2SC1313-G or F (2SC1345-E or D)		
Q5	Transistor	2SC1313-G or F (2SC1345-E or D)		
Q6	Transistor	2SC1313-G or F (2SC1345-E or D)		

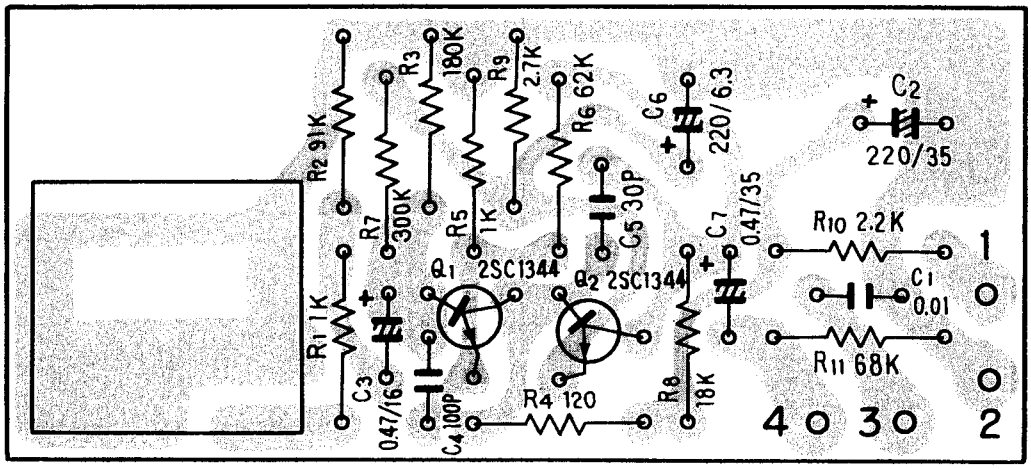
CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	1	25V	CSSA 010M 25	
C2	Electrolytic	1	25V	CSSA 010M 25	
C3	Ceramic	100p	50V	CCDSL 101K 50	
C4	Ceramic	100p	50V	CCDSL 101K 50	
C5	Ceramic	82p	50V	CCDSL 820K 50	
C6	Ceramic	82p	50V	CCDSL 820K 50	
C7	Electrolytic	330	6V	CEA 331P 6	
C8	Electrolytic	330	6V	CEA 331P 6	
C9	Ceramic	4p	50V	CCDSL 040D 50	
C10	Ceramic	4p	50V	CCDSL 040D 50	
C11	Electrolytic	3.3	25V	CEANL 3R3P 25	
C12	Electrolytic	3.3	25V	CEANL 3R3P 25	
C13	Styrol	0.0051	50V	CQSA 512G 50	
C14	Styrol	0.0051	50V	CQSA 512G 50	
C15	Styrol	0.0015	50V	CQSA 152G 50	
C16	Styrol	0.0015	50V	CQSA 152G 50	
C17	Electrolytic	100	25V	CEA 101P 25	
C18	Electrolytic	220	16V	CEA 221P 16	

13. 4 MICROPHONE AMPLIFIER ASSEMBLY (AWM-064-0)



Foil Side (AWM-064-0)



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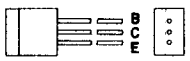

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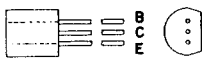


Parts List of Microphone Amplifier Assembly

OTHERS

Symbol	Description	Part No.	
	Phone jack (Microphe)	AKN-007-0	

SEMICONDUCTORS

Symbol	Description	Part No.	
Q1	Transistor 2SC1344-E or D (2SC1312-G or F)		
Q2	Transistor 2SC1344-E or D (2SC1312-G or F)		

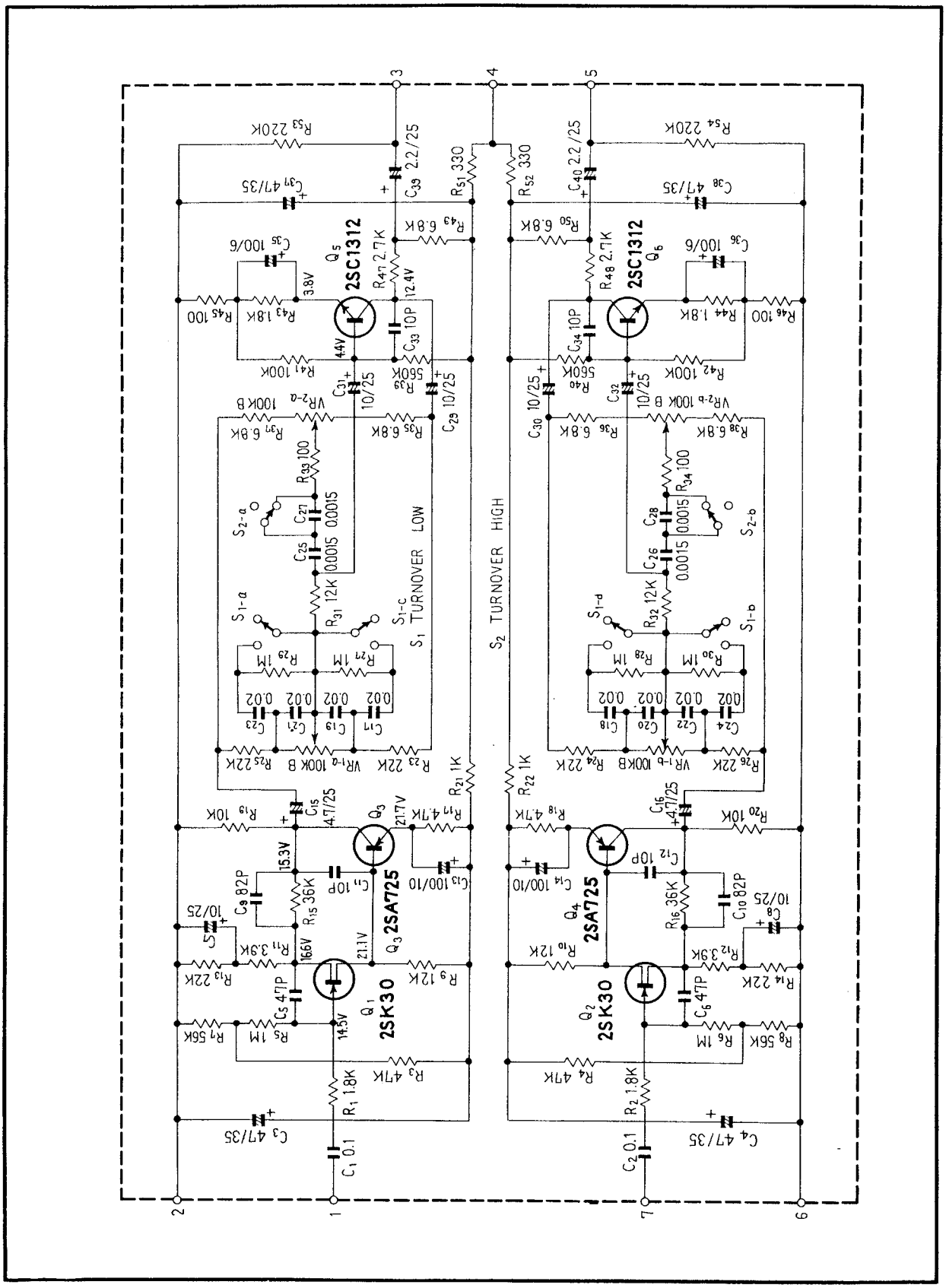
CAPACITORS

Symbol	Description	Part No.	
C1	Ceramic 0.01 50V	CKDYF 103Z 50	
C2	Electrolytic 220 35V	CEA 221P 35	
C3	Electrolytic 0.47 16V	CSSA R47M 16	
C4	Ceramic 100p 50V	CCDSL 101K 50	
C5	Ceramic 30p 50V	CCDSL 300K 50	
C6	Electrolytic 220 6V	CEA 221P 6	
C7	Electrolytic 0.47 50V	CEANL R47P 50	

RESISTORS

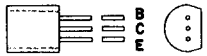
Symbol	Description	Part No.	
R1	Carbon film 1k	RD¼PM 102J	
R2	Carbon film 91k	RD¼PM 913J	
R3	Carbon film 180k	RD¼PM 184J	
R4	Carbon film 120k	RD¼PM 124J	
R5	Carbon film 1k	RD¼PM 102J	
R6	Carbon film 62k	RD¼PM 623J	
R7	Carbon film 300k	RD¼PM 304J	
R8	Carbon film 18k	RD¼PM 183J	
R9	Carbon film 2.7k	RD¼PM 272J	
R10	Carbon film 2.2k	RD¼PM 222J	
R11	Carbon film 68k	RD¼PM 683J	

13. 5 CONTROL AMPLIFIER ASSEMBLY (AWG-029-0)

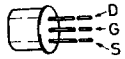


2SC1344

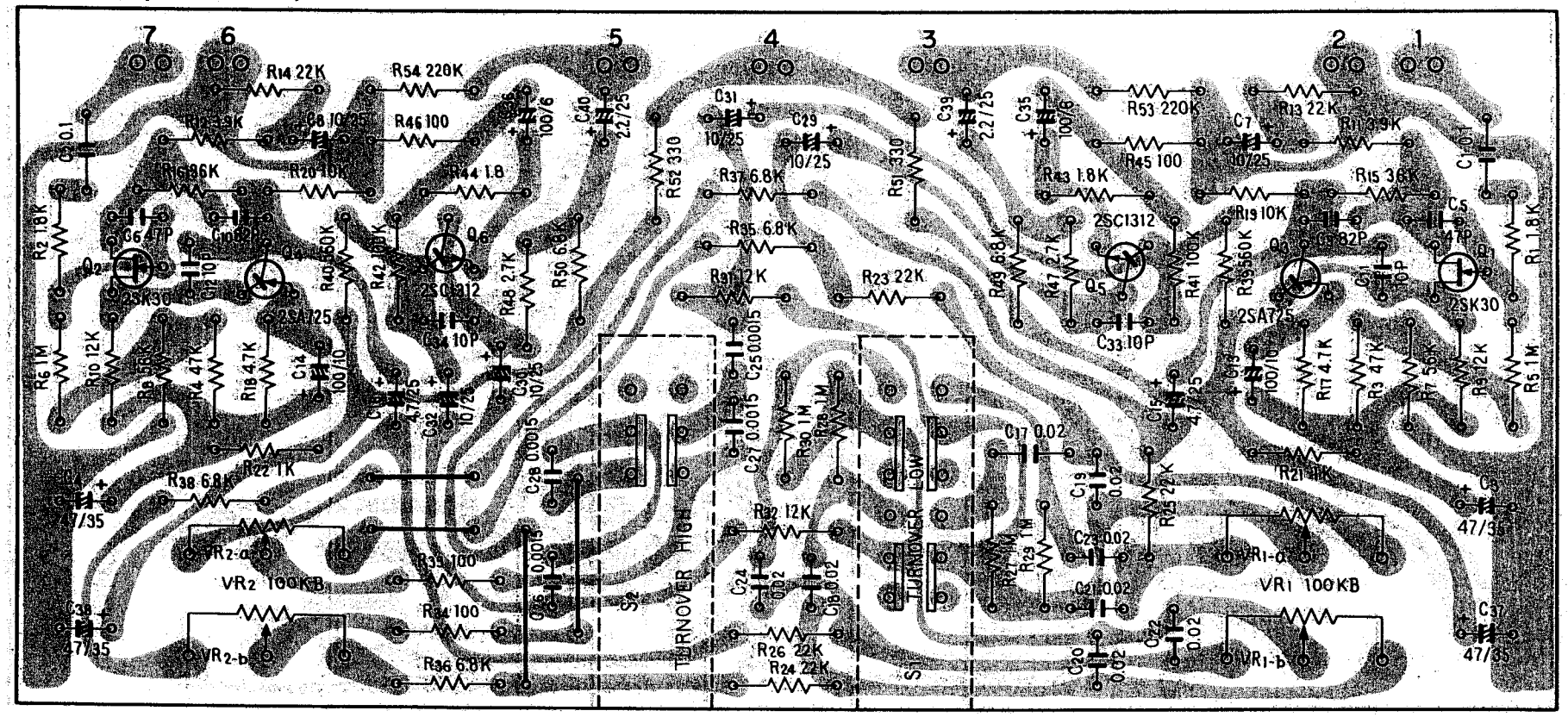
2SA725
2SC1312



2SK30



Foil Side (AWG-029-0)



Parts List of Control Amplifier Assembly

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	FET	2SK30-Y		
Q2	FET	2SK30-Y		
Q3	Transistor	2SA725-F or G		
Q4	Transistor	2SA725-F or G		
Q5	Transistor	2SC1312-F or G (2SC1344-D or E)		
Q6	Transistor	2SC1312-F or G (2SC1344-D or E)		

CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.1	50V	CQMA 104K 50	
C2	Mylar	0.1	50V	CQMA 104K 50	
C3	Electrolytic	47	35V	CEA 470P 35	
C4	Electrolytic	47	35V	CEA 470P 35	
C5	Ceramic	47p	50V	CCDSL 470K 50	
C6	Ceramic	47p	50V	CCDSL 470K 50	
C7	Electrolytic	10	25V	CSZA 100P 25	
C8	Electrolytic	10	25V	CSZA 100P 25	
C9	Ceramic	82p	50V	CCDSL 820K 50	
C10	Ceramic	82p	50V	CCDSL 820K 50	
C11	Ceramic	10p	50V	CCDSL 100K 50	
C12	Ceramic	10p	50V	CCDSL 100K 50	
C13	Electrolytic	100	10V	CEA 101P 10	
C14	Electrolytic	100	10V	CEA 101P 10	
C15	Electrolytic	4.7	25V	CEANL 4R7P 25	
C16	Electrolytic	4.7	25V	CEANL 4R7P 25	
C17	Mylar	0.02	50V	CQMA 203J 50	
C18	Mylar	0.02	50V	CQMA 203J 50	
C19	Mylar	0.02	50V	CQMA 203J 50	
C20	Mylar	0.02	50V	CQMA 203J 50	
C21	Mylar	0.02	50V	CQMA 203J 50	
C22	Mylar	0.02	50V	CQMA 203J 50	
C23	Mylar	0.02	50V	CQMA 203J 50	
C24	Mylar	0.02	50V	CQMA 203J 50	
C25	Mylar	0.0015	50V	CQMA 152J 50	
C26	Mylar	0.0015	50V	CQMA 152J 50	
C27	Mylar	0.0015	50V	CQMA 152J 50	
C28	Mylar	0.0015	50V	CQMA 152J 50	
C29	Electrolytic	10	25V	CSZA 100P 25	
C30	Electrolytic	10	25V	CSZA 100P 25	
C31	Electrolytic	10	25V	CSZA 100P 25	
C32	Electrolytic	10	25V	CSZA 100P 25	
C33	Ceramic	10p	50V	CCDSL 100K 50	
C34	Ceramic	10p	50V	CCDSL 100K 50	
C35	Electrolytic	100	6V	CEA 101P 6	

Parts List of Power Amplifier Assembly (AWH-031-A)

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SA726-F or G		
Q2	Transistor	2SA726-F or G		
Q3	Transistor	2SA726-F or G		
Q4	Transistor	2SA726-F or G		
Q5	Transistor	2SC1451-V or B		
Q6	Transistor	2SC1451-V or B		
Q7	Transistor	2SB528-C or D		
Q8	Transistor	2SB528-C or D		
Q9	Transistor	2SD358-C or D		
Q10	Transistor	2SD358-C or D		
Q11	Transistor	2SC1079-R or Y (2SC1116-R, O or Y) (2SD287-L or M)		
Q13	Transistor	2SC1079-R or Y (2SC1116-R, O or Y) (2SD287-L or M)		
Q12	Transistor	2SA679-R or Y (2SA747-R, O or Y) (2SB539-L or M)		
Q14	Transistor	2SA679-R or Y (2SA747-R, O or Y) (2SB539-L or M)		
D1	Diode	1S2473		
D2	Varistor	STV-4H		
D3	Varistor	STV-4H		
D4	Diode	1S2473		
D5	Diode	1S2473		

RESISTORS AND POTENTIOMETERS

Symbol	Description		Part No.	
VR1	Variable resistor	100k-B	ACP-029-A	
VR2	Variable resistor	100k-B	ACP-029-A	
VR3	Variable resistor	100-B	ACP-019-B	
VR4	Variable resistor	100-B	ACP-019-B	
R1	Carbon film	15k	RD¼PS 153J	
R2	Carbon film	180k	RD¼PS 184J	
R3	Carbon film	180k	RD¼PS 184J	
R4	Carbon film	1k	RD¼PS 102J	
R5	Carbon film	6.8k	RD¼PS 682J	
R6	Carbon film	390k	RD¼PS 394J	

Continued on the Next Page

Symbol	Description			Part No.	
R7	Carbon film	390k		RD¼PS 394J	
R8	Carbon film	100k		RD¼PS 104J	
R9	Carbon film	9.1k		RD¼PS 912J	
R10	Carbon film	2.2k		RD¼PS 222J	
R11	Carbon film	2.2k		RD¼PS 222J	
R12	Carbon film	9.1k		RD¼PS 912J	
R13	Carbon film	100k		RD¼PS 104J	
R14	Carbon film	100k		RD¼PS 104J	
R15	Carbon film	100k		RD¼PS 104J	
R16	Carbon film	56k		RD¼PS 563J	
R17	Carbon film	110k		RD¼PS 114J	
R18	Carbon film	110k		RD¼PS 114J	
R19	Carbon film	3.9k		RD¼PS 392J	
R20	Carbon film	3.9k		RD¼PS 392J	
R21	Carbon film	24k		RD¼PS 243J	
R22	Carbon film	24k		RD¼PS 243J	
R23	Carbon film	1k		RD¼PS 102J	
R24	Carbon film	1k		RD¼PS 102J	
R25	Carbon film	22k		RD¼PS 223J	
R26	Carbon film	22k		RD¼PS 223J	
R27	Metal oxide	1k	1W	RS1P 102J	
R28	Metal oxide	1k	1W	RS1P 102J	
R29	Carbon film	3.9k		RD¼PS 392J	
R30	Carbon film	3.9k		RD¼PS 392J	
R31	Carbon film	150	½W	RD½PS 151J	
R32	Carbon film	150	½W	RD½PS 151J	
R33	Carbon film	150	½W	RD½PS 151J	
R34	Carbon film	150	½W	RD½PS 151J	
R35	Metal film	4.7	1W	RN1H 4R7K	
R36	Metal film	4.7	1W	RN1H 4R7K	
R37	Metal film	4.7	1W	RN1H 4R7K	
R38	Metal film	4.7	1W	RN1H 4R7K	
R39	Metal oxide	10	1W	RS1P 100J	
R40	Metal oxide	10	1W	RS1P 100J	
R41	Wire wound	0.5	5W	RT5B 0R5K	
R42	Wire wound	0.5	5W	RT5B 0R5K	
R43	Wire wound	0.5	5W	RT5B 0R5K	
R44	Wire wound	0.5	5W	RT5B 0R5K	
R45	Metal oxide	10	2W	RS2P 100J	
R46	Metal oxide	10	2W	RS2P 100J	
R47	Carbon film	1		RD¼PS 010J	
R48	Carbon film	1		RD¼PS 010J	

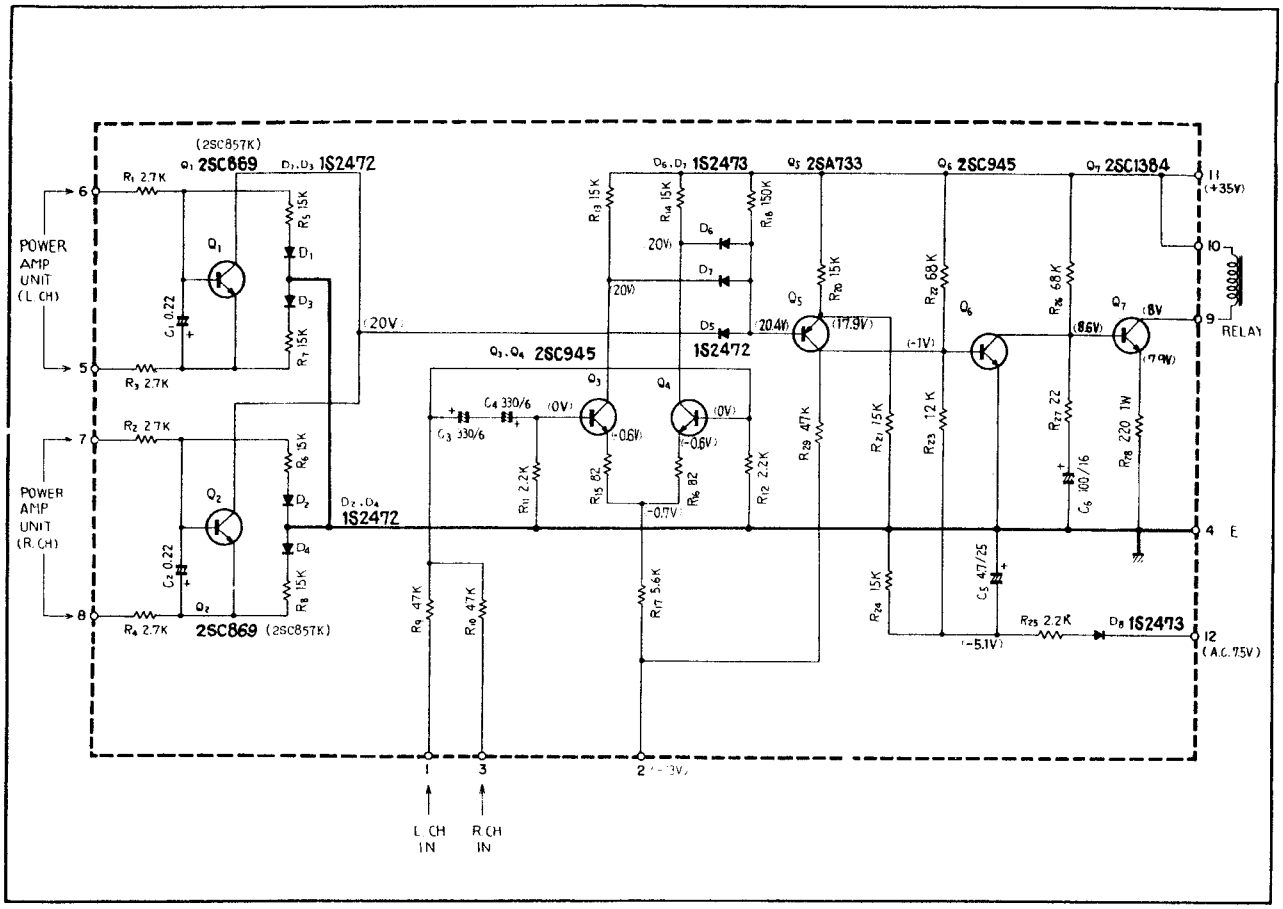
CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	1	25V	CSSA 010M 25	
C2	Electrolytic	1	25V	CSSA 010M 25	
C3	Electrolytic	0.47	25V	CSSA R47M 25	
C4	Electrolytic	0.47	25V	CSSA R47M 25	
C5	Ceramic	100p	50V	CCDSL 101K 50	
C6	Ceramic	100p	50V	CCDSL 101K 50	
C7	Electrolytic	33	16V	CEA 330P 16	
C8	Electrolytic	33	16V	CEA 330P 16	
C9	Ceramic	56p	50V	CCDSL 560K 50	
C10	Ceramic	56p	50V	CCDSL 560K 50	
C11	Electrolytic	330	10V	CEA 331P 10	
C12	Electrolytic	330	10V	CEA 331P 10	
C13	Electrolytic	100	50V	CEA 101P 50	
C14	Electrolytic	100	50V	CEA 101P 50	
C15	Ceramic	12p	500V	CCDSL 120K 500	
C16	Ceramic	12p	500V	CCDSL 120K 500	
C17	Ceramic	82p	500V	CCDSL 820K 500	
C18	Ceramic	82p	500V	CCDSL 820K 500	
C19	Ceramic	82p	500V	CCDSL 820K 500	
C20	Ceramic	82p	500V	CCDSL 820K 500	
C21	Mylar	0.056	50V	CQMA 563M 50	
C22	Mylar	0.056	50V	CQMA 563M 50	

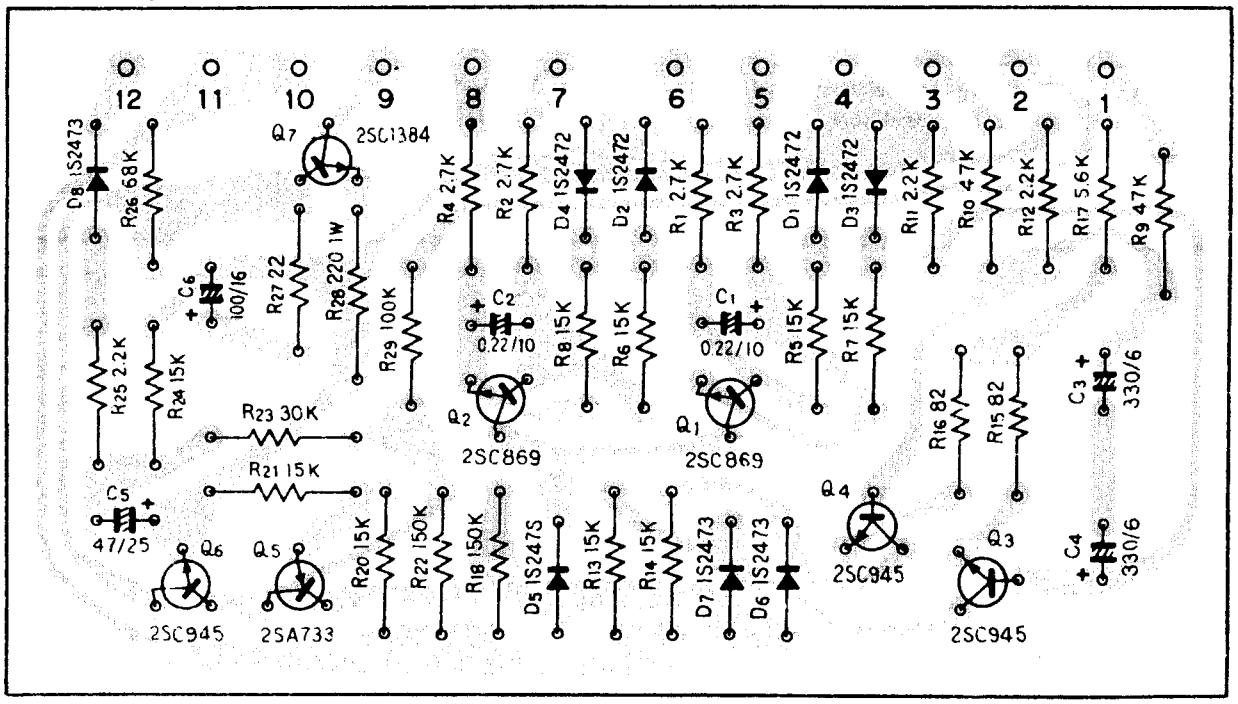
OTHERS

Symbol	Description	Part No.	
L1	AF choke coil	T63-009-0	
L2	AF choke coil	T63-009-0	
	Socket (power transistor)	AKH-001-0	
	Spacer (insulator)	AEC-076-0	
	Heat sink	ANH-117-0	
	Fuse holder	AKR-013-0	

13. 7 PROTECTION CIRCUIT ASSEMBLY (AWM-025-C)



Foil Side (AWM-025-C)



Parts List of Power Supply Circuit Assembly (AWR-055-0)

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SD313-E		
Q2	Transistor	2SD313P-E or D		
Q3	Transistor	2SC945-Q or R		
D1	Diode	SR3AM-8		
D2	Diode	SR3AM-8		
D3	Diode	SR3AM-8		
D4	Diode	SR3AM-8		
D5	Diode	1S1886		
D6	Diode	1S1850		
D7	Diode	1S1885		
D8	Zener diode	WZ-130		
D9	Zener diode	WZ-130		

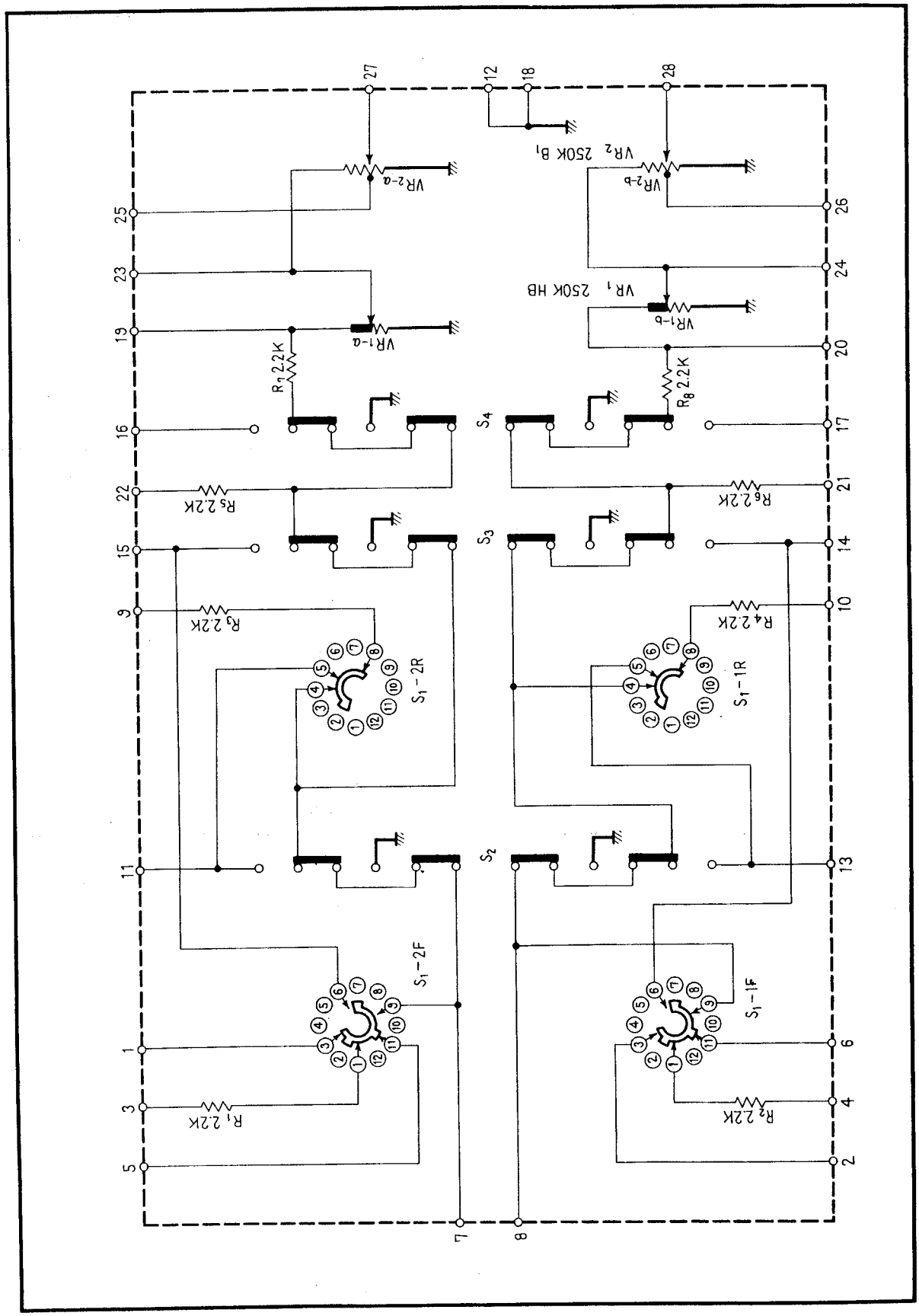
RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	220	½W	RD½PS 221J	
R2	Metal oxide	2.2k	1W	RS1P 222K	
R3	Wire wound	220	5W	RT5B 221K	
R4	Carbon film	1.5k		RD¼PS 152J	
R5	Carbon film	1.5k		RD¼PS 152J	
R6	Carbon film	3.3k		RD¼PS 332J	
R7	Carbon film	27k		RD¼PS 273J	
R8	Carbon film	18k		RD¼PS 183J	
R9	Carbon film	4.7		RD¼PS 4R7J	
R10	Carbon film	360		RD¼PS 361J	
R11	Carbon film	5.1k		RD¼PS 512J	
R12	Carbon film	1.8k		RD¼PS 182J	

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	150V	ACG-004-0	
C2	Ceramic	0.01	150V	ACG-004-0	
C3	Ceramic	0.01	150V	ACG-004-0	
C4	Ceramic	0.01	150V	ACG-004-0	
C5	Ceramic	0.01	150V	ACG-004-0	
C6	Ceramic	0.01	150V	ACG-004-0	
C7	Ceramic	0.01	150V	ACG-004-0	
C8	Electrolytic	470	80V	ACH-038-0	
C9	Electrolytic	470	80V	ACH-038-0	
C10	Electrolytic	100	50V	CEA 101P 50	
C11	Electrolytic	100	50V	CEA 101P 50	
C12	Electrolytic	220	16V	CEA 221P 16	
C13	Electrolytic	2,200	10V	CEA 222P 10	
C14	Electrolytic	220	50V	CEA 221P 50	
C15	Electrolytic	470	16V	CEA 471P 16	
C16	Ceramic	100p	50V	CCDSL 101K 50	

13. 9 SWITCH & VOLUME ASSEMBLY (AWX-070-0)

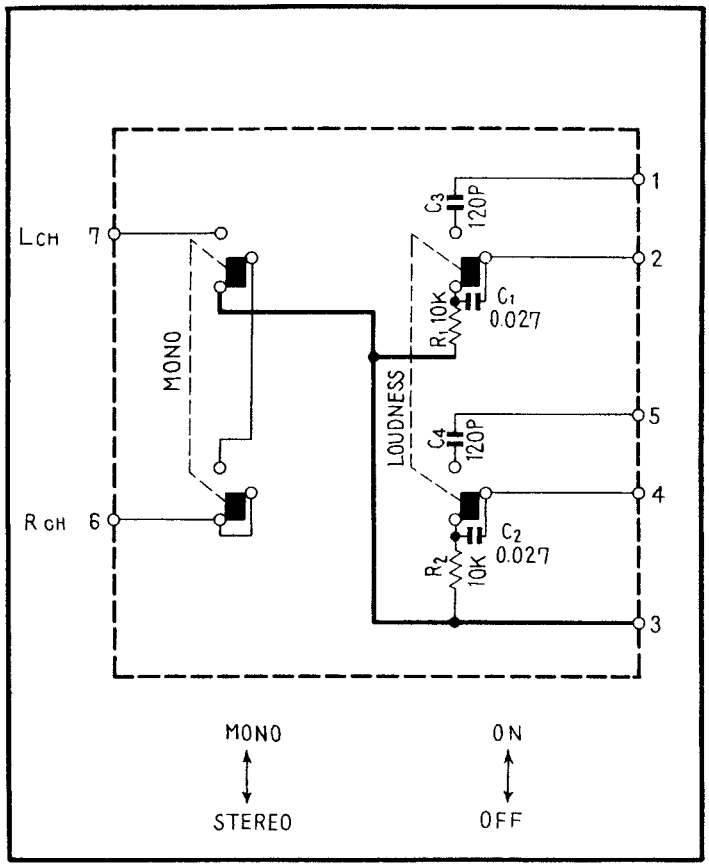


Parts List of Switch Circuit Assembly (AWS-073-0)

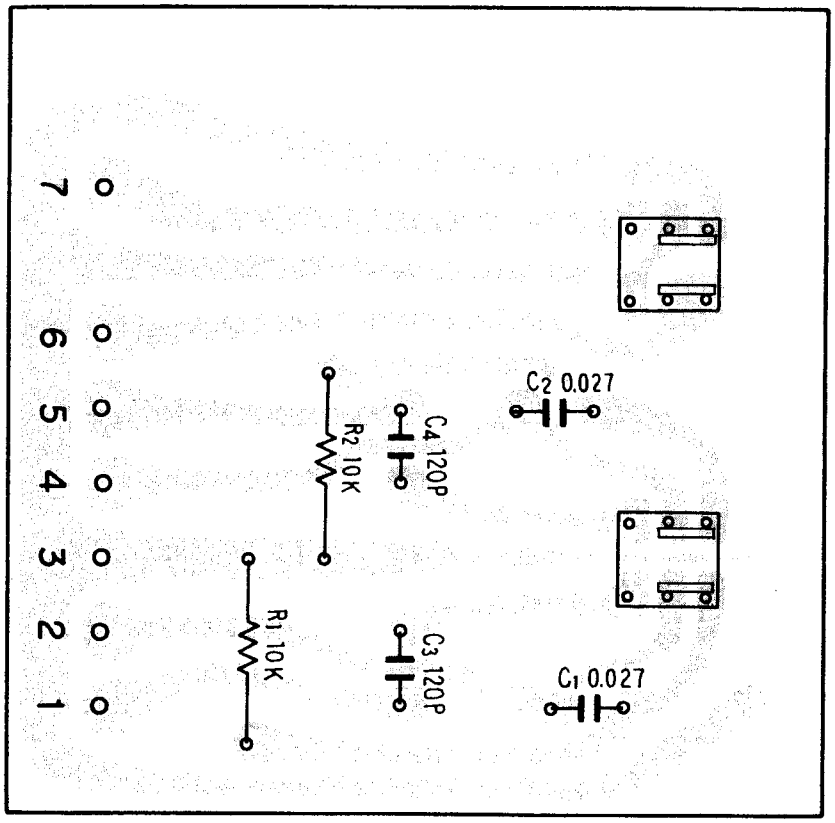
SWITCH AND RESISTORS

Symbol	Description		Part No.	
S1	Push switch	(Function)	ASG-069-A	
R1	Carbon film	2.2k	RD¼PM 222J	
R2	Carbon film	2.2k	RD¼PM 222J	
R3	Carbon film	2.2k	RD¼PM 222J	
R4	Carbon film	2.2k	RD¼PM 222J	
R5	Carbon film	2.2k	RD¼PM 222J	
R6	Carbon film	2.2k	RD¼PM 222J	
R7	Carbon film	2.2k	RD¼PM 222J	
R8	Carbon film	2.2k	RD¼PM 222J	
R9	Carbon film	100	RD¼PM 101J	

13.11 SWITCH CIRCUIT ASSEMBLY (AWS-065-0)



Foil Side (AWS-065-0)



Parts List of Switch Circuit Assembly (AWS-065-0)

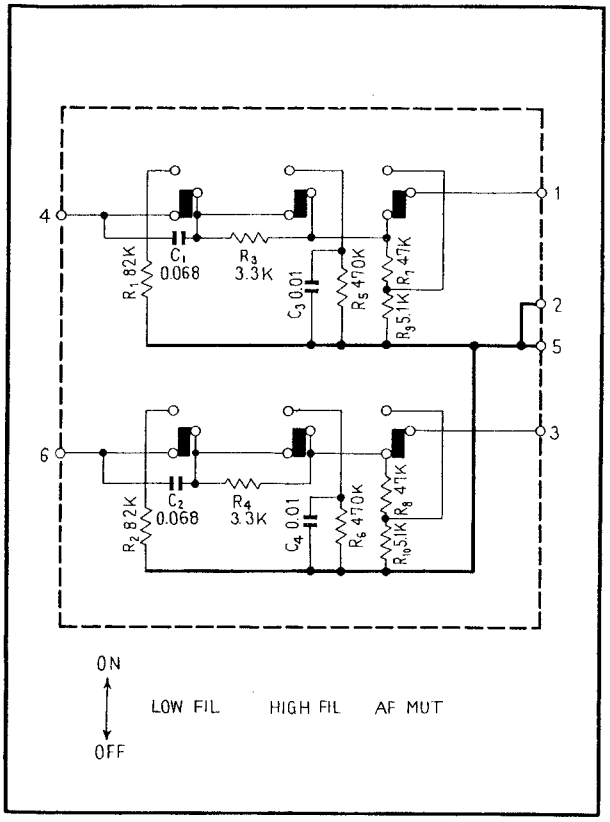
SWITCH

Symbol	Description	Part No.	
S1	Push switch (mode, loudness)	ASG-063-0	

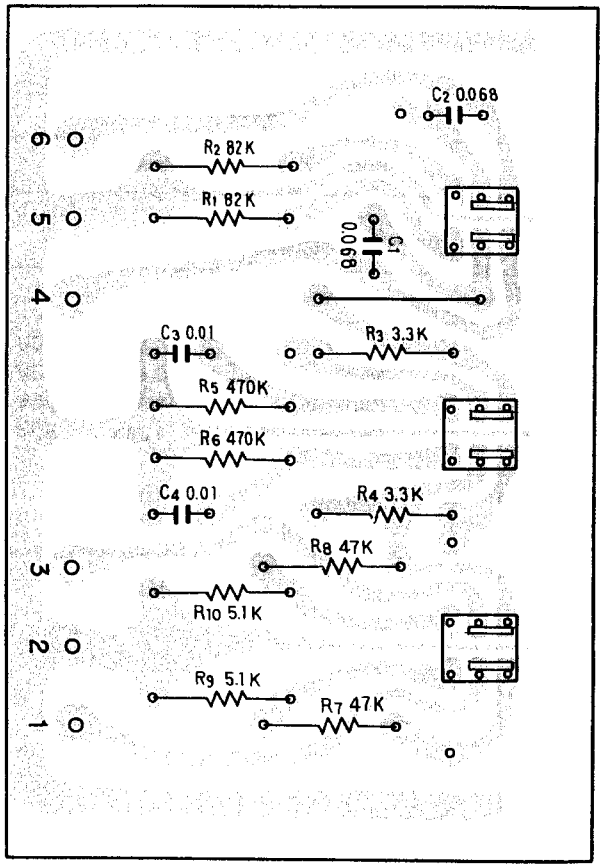
CAPACITORS AND RESISTORS

Symbol	Description			Part No.	
C1	Mylar	0.027	50V	CQMA 273J 50	
C2	Mylar	0.027	50V	CQMA 273J 50	
C3	Ceramic	120p	50V	CCDSL 121K 50	
C4	Ceramic	120p	50V	CCDSL 121K 50	
R1	carbon film	10k		RD¼PS 103J	
R2	carbon film	10k		RD¼PS 103J	

13.12 SWITCH CIRCUIT ASSEMBLY (AWS-066-0)



Foil Side



SWITCH

Symbol	Description	Part No.	
S1	Push switch (filter, AF muting)	ASG-062-0	

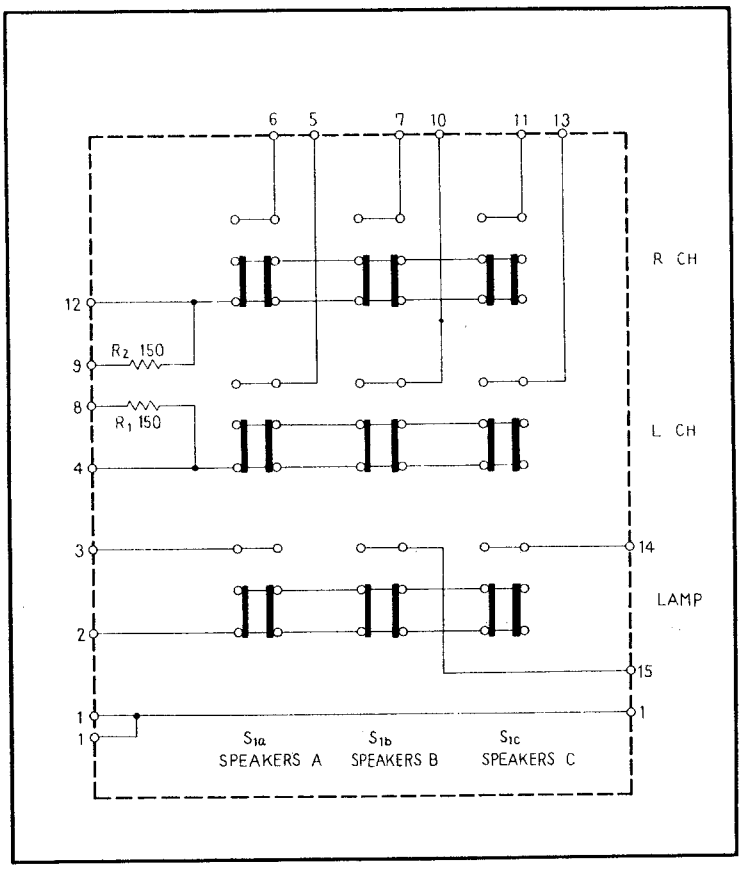
CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.068	50V	CQMA 683K 50	
C2	Mylar	0.068	50V	CQMA 683K 50	
C3	Mylar	0.01	50V	CQMA 103K 50	
C4	Mylar	0.01	50V	CQMA 103K 50	

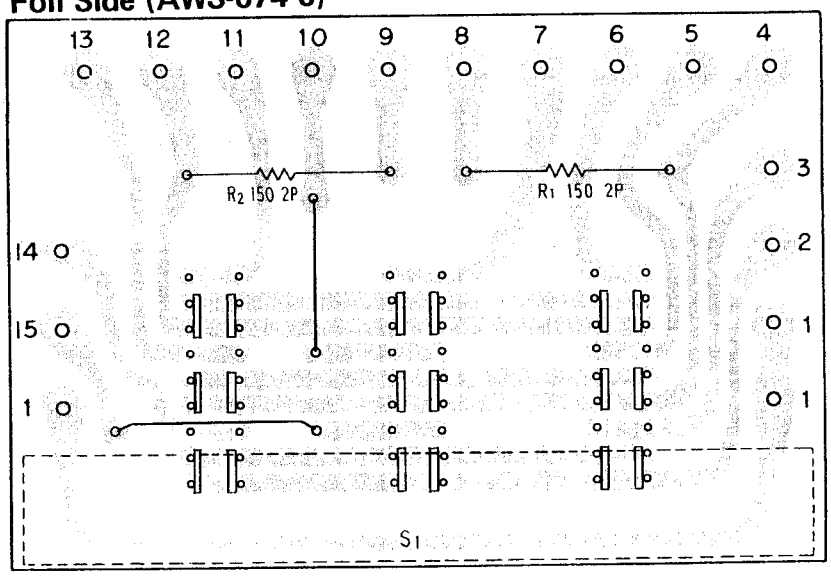
RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	82k	RD¼PM 823J	
R2	Carbon film	82k	RD¼PM 823J	
R3	Carbon film	3.3k	RD¼PM 332J	
R4	Carbon film	3.3k	RD¼PM 332J	
R5	Carbon film	470k	RD¼PM 474J	
R6	Carbon film	470k	RD¼PM 474J	
R7	Carbon film	47k	RD¼PM 473J	
R8	Carbon film	47k	RD¼PM 473J	
R9	Carbon film	5.1k	RD¼PM 512J	
R10	Carbon film	5.1k	RD¼PM 512J	

12.13 SWITCH CIRCUIT ASSEMBLY (AWS-074-0)



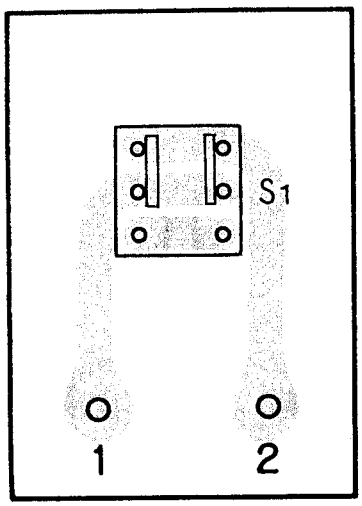
Foil Side (AWS-074-0)



Symbol	Description			Part No.	
S1	Push switch (speakers)			ASG-068-0	
R1	Metal oxide	150	2W	RS2P 151K	
R2	Metal oxide	150	2W	RS2P 151K	

13.14 SWITCH CIRCUIT ASSEMBLY (AWS-075-0)

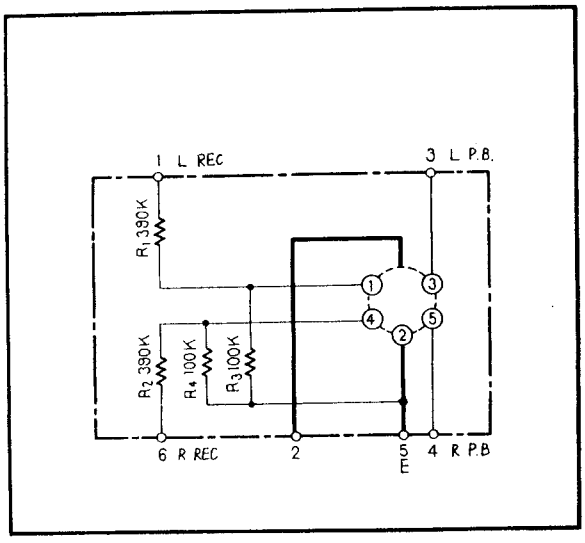
Foil side



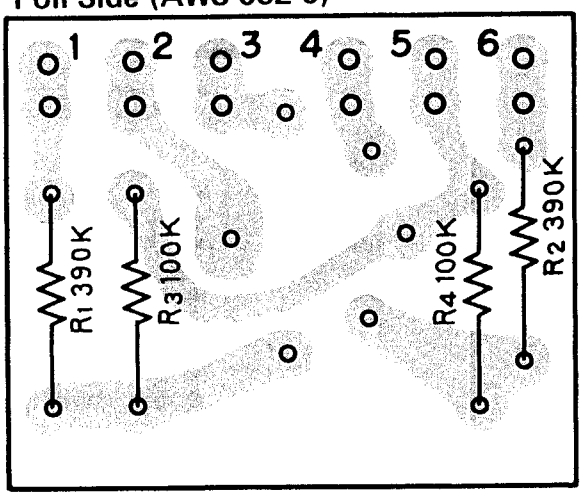
Parts List of Switch Circuit Assembly

Symbol	Description	Part No.	
S1	Push switch (FM muting)	ASG-058-0	

13.15 5P CONNECTOR ASSEMBLY (AWX-062-0)

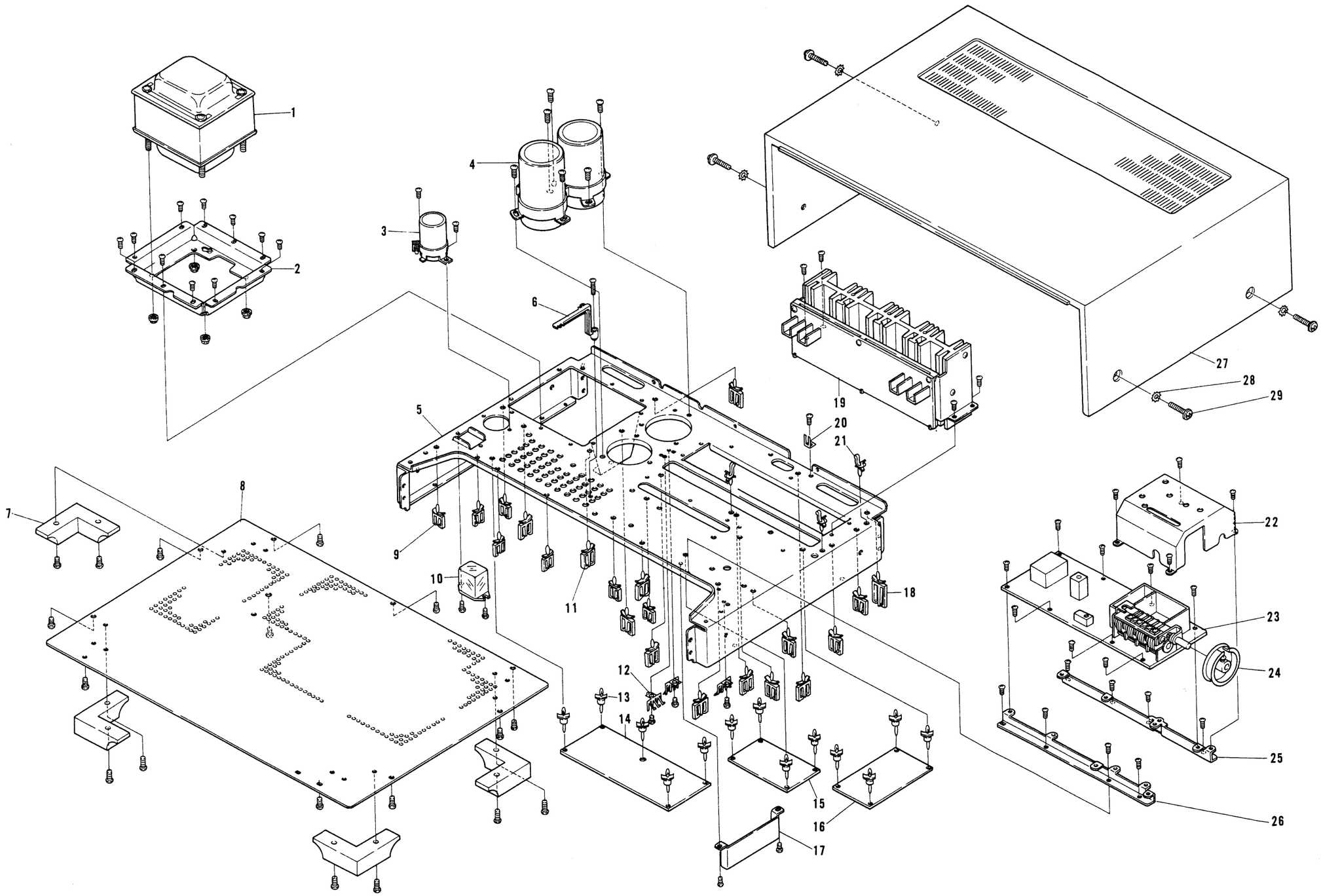


Foil Side (AWS-062-0)



Symbol	Description		Part No.	
	Connector (DIN type 5P)		AKP-007-0	
R1	Carbon film	390k	RD¼PS 394J	
R2	Carbon film	390k	RD¼PS 394J	
R3	Carbon film	100k	RD¼PS 104J	
R4	Carbon film	100k	RD¼PS 104J	

Exploded View-1



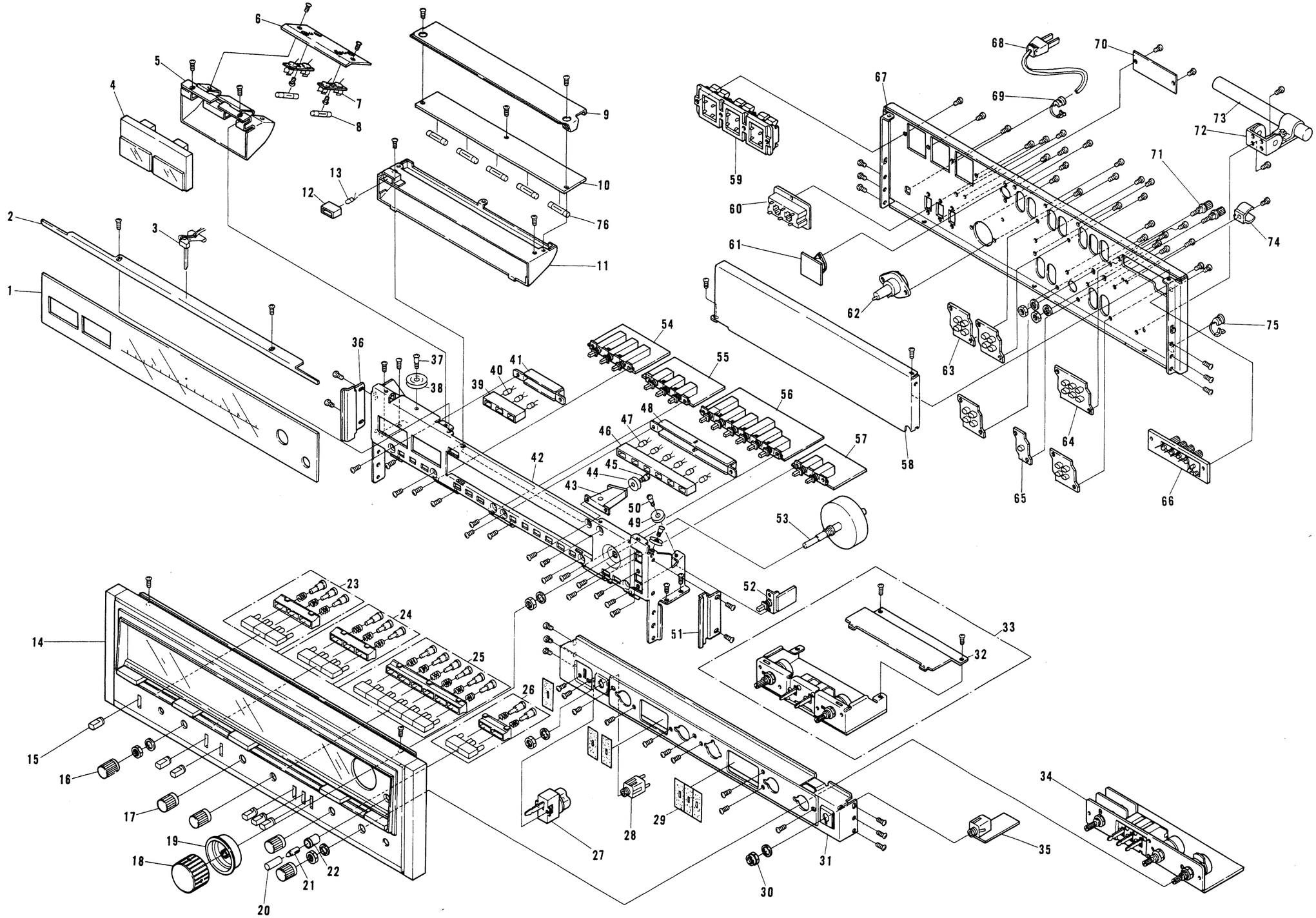
NOTICE: Any parts asterisked (*) are subject to being not supplied.

Parts List of Exploded View-2

Key No.	Description	Part No.	
1	Dial scale	AAG-075-A	
2*	Dial scale-held metal	ANF-243-A	
3	Dial pointer assembly	AAF-031-A	
4	Meter (Signal & Tuning)	AAW-029-0	
5*	Lamp box	ANH-211-B	
6*	Lamp holder	ANG-097-0	
7	Pilot lamp socket	AKK-002-0	
8	Pilot lamp 8V, 0.3A (meter)	AEL-015-0	
9*	P.C. board cover	ANG-100-0	
10	Lamp board assembly	AWX-069-0	
11*	Lamp box	ANH-210-A	
12	Rubber bracket	AEB-031-A	
13	Pilot lamp 6V, 30mA (Stereo indicator)	AEL-014-0	
14	Front panel assembly	ANB-262-B	
15	Knob (Power, Turn over, Tape monitor, NR adaptor)	AAD-040-0	
16	Knob (Bass)	AAB-068-A	
17	Knob (Treble, Volume, Balance, Rec selector)	AAB-068-A	
18	Knob (Tuning)	AAA-026-0	
19	Ornamental ring	AAC-034-0	
20	Knob (FM muting)	AAD-082-A	
21	Coupler (Knob-to-switch)	AAE-007-0	
22	Spacer	AEC-152-A	
23	Knob (SPKR A, B, C)	AAD-064-A	
24	Knob (Low cut, High cut, −20dB)	AAD-065-A	
25	Knob (Function)	AAD-066-A	
26	Knob (Mode, Loudness)	AAD-067-A	
27	Lever switch (Power)	ASK-066-0	KCU
	Lever switch (Power)	ASK-067-0	F
	Lever switch (Power)	ASK-068-0	GN
28	Phone jack (Headphone)	K72-026-0	
29	Shading plate	AED-018-0	
30	Nut (insulator)	B71-031-0	
31*	Sub-chassis	AND-074-B	
32*	Shield cover	ANF-234-0	
33	Control amplifier assembly	AWG-029-0	
34	Switch & volume circuit assembly	AWX-070-0	
35	Microphone amplifier assembly	AWM-064-0	
36*	Shading metal	ANF-249-0	
37*	Pulley shaft	M49-025-E	
38*	Pulley	AEC-153-0	
39	Rubber bracket	AEB-057-A	
40	Pilot lamp 8V,50mA (program indicator)	AEL-022-0	

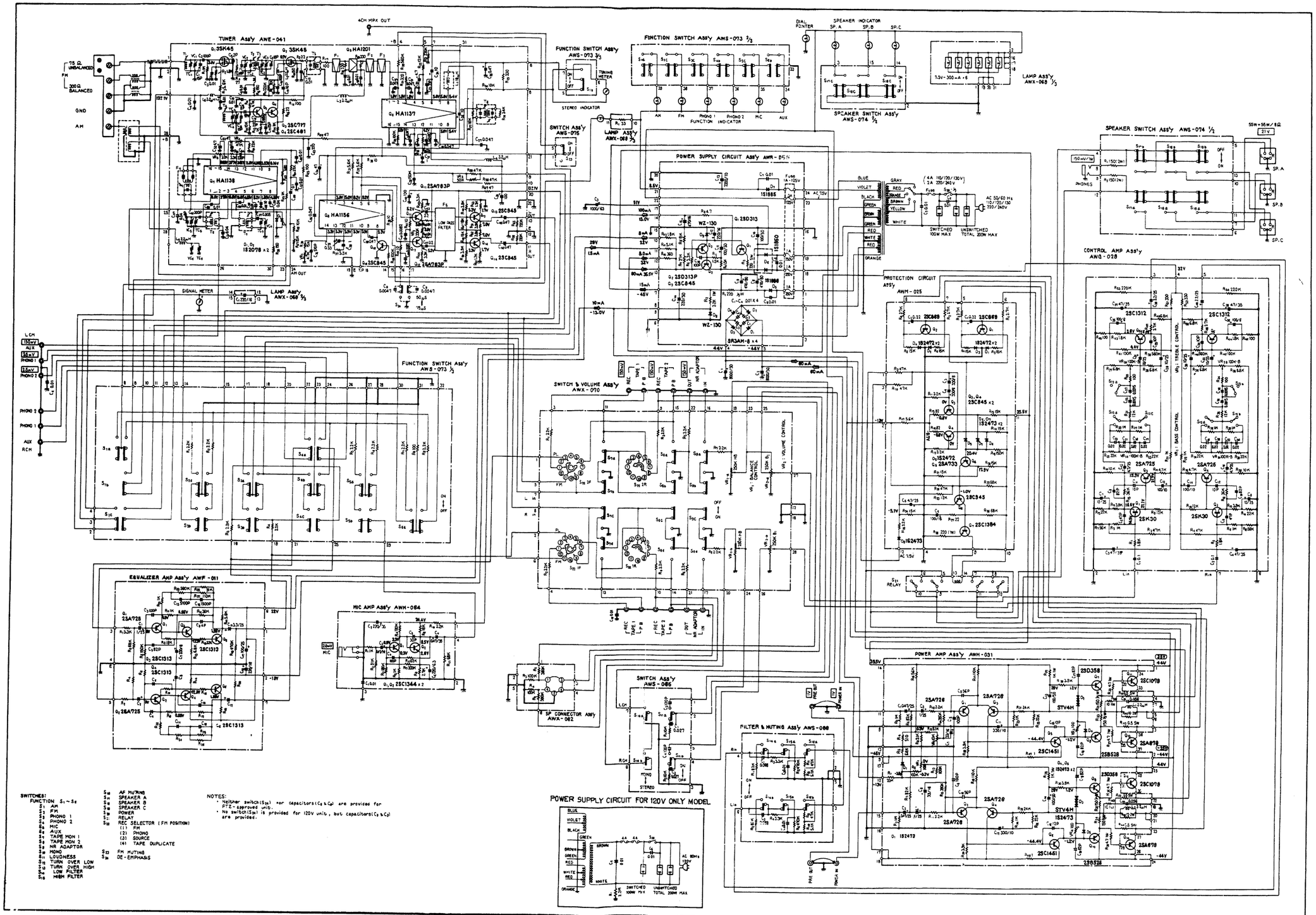
Key No.	Description	Part No.	
41*	Lamp holder	ANG-103-0	
42*	Sub-panel	AND-073-B	
43*	Pulley-held metal	ANG-102-A	
44*	Pulley	AEC-101-0	
45*	Pulley shaft	M49-025-E	
46	Rubber bracket	AEB-057-A	
47	Pilot lamp 8V,50mA (program indicator)	AEL-023-0	
48*	Lamp holder	ANG-104-0	
49*	Pulley	AEC-101-0	
50*	Pulley shaft	M49-025-E	
51*	Shading metal	ANF-249-0	
52	Switch circuit assembly (FM muting)	AWS-075-0	
53	Tuning shaft assembly	AXA-056-0	
54	Switch circuit assembly (speakers)	AWS-074-0	
55	Switch circuit assembly (filter, AF muting)	AWS-066-0	
56	Switch circuit assembly(function)	AWS-073-0	
57	Switch circuit assembly(mode, loudness)	AWS-065-0	
58*	Shield cover	ANF-233-0	
59	Speaker output terminal	AKE-014-0	
60	AC socket	AKP-005-0	KCU, F
61	5P connector assembly	AWX-062-0	
62	Fuse holder	AKR-008-0	KCU
	Fuse holder	AKR-001-0	F
63	Phono jack-A (4 jacks)	AKB-014-0	
64	Phono jack-C (6 jacks)	AKB-016-0	
65	Phono jack (1 jack)	AKB-019-0	
66	Antenna terminal board	AKA-002-0	
67*	Rear panel	ANC-107-D	KCU
	Rear panel	ANC-112-B	F
	Rear Panel	ANC-114-0	GN
68	AC power cord	ADG-005-0	KCU
	AC power cord	ADG-004-0	F
69	AC cord grommet	AEC-079-0	KCU, F
	Connector (AC power)	AKP-008-0	GN
70*	Model name plate	AAL-186-0	KCU
	Model name plate	AAL-202-0	F
	Model name plate	AAL-188-0	GN
71	Binding post for ground	AKE-012-A	
72	Ferrite antenna holder assembly	AXB-001-A	
73	Ferrite loopstick antenna	ATB-026-0	
74	Antenna clamper	AEC-154-0	
75	AC cord grommet	AEC-079-0	

Exploded View-2



13. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LIST

13. 1 CIRCUIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS



• CAPACITORS: IN μF UNLESS OTHERWISE NOTED p: pF
• RESISTORS: INΩ, ¼W UNLESS OTHERWISE NOTED k: kΩ, M: MΩ

Miscellaneous Parts List

CAPACITORS

Symbol	Description	Part No.	
C1	Electrolytic 8,000 50V	ACH-015-0	
C2	Electrolytic 8,000 50V	ACH-015-0	
C3	Electrolytic 1,000 63V	ACH-001-C	
C4	Ceramic 0.01 50V	CKDYF 103Z 50	
C6	Ceramic 0.01 250V	ACG-001-0	
C7	Ceramic 0.01 250V	ACG-003-0	KCU
	Ceramic 0.01 250V	ACG-001-0	F
C8	Mylar 0.0007 50V	CQMA 472J 50	
C9	Mylar 0.0047 50V	CQMA 472J 50	

RESISTOR

Symbol	Description	Part No.	
R1	Carbon film 2.2M ½W	RD½PS 225J	KCU

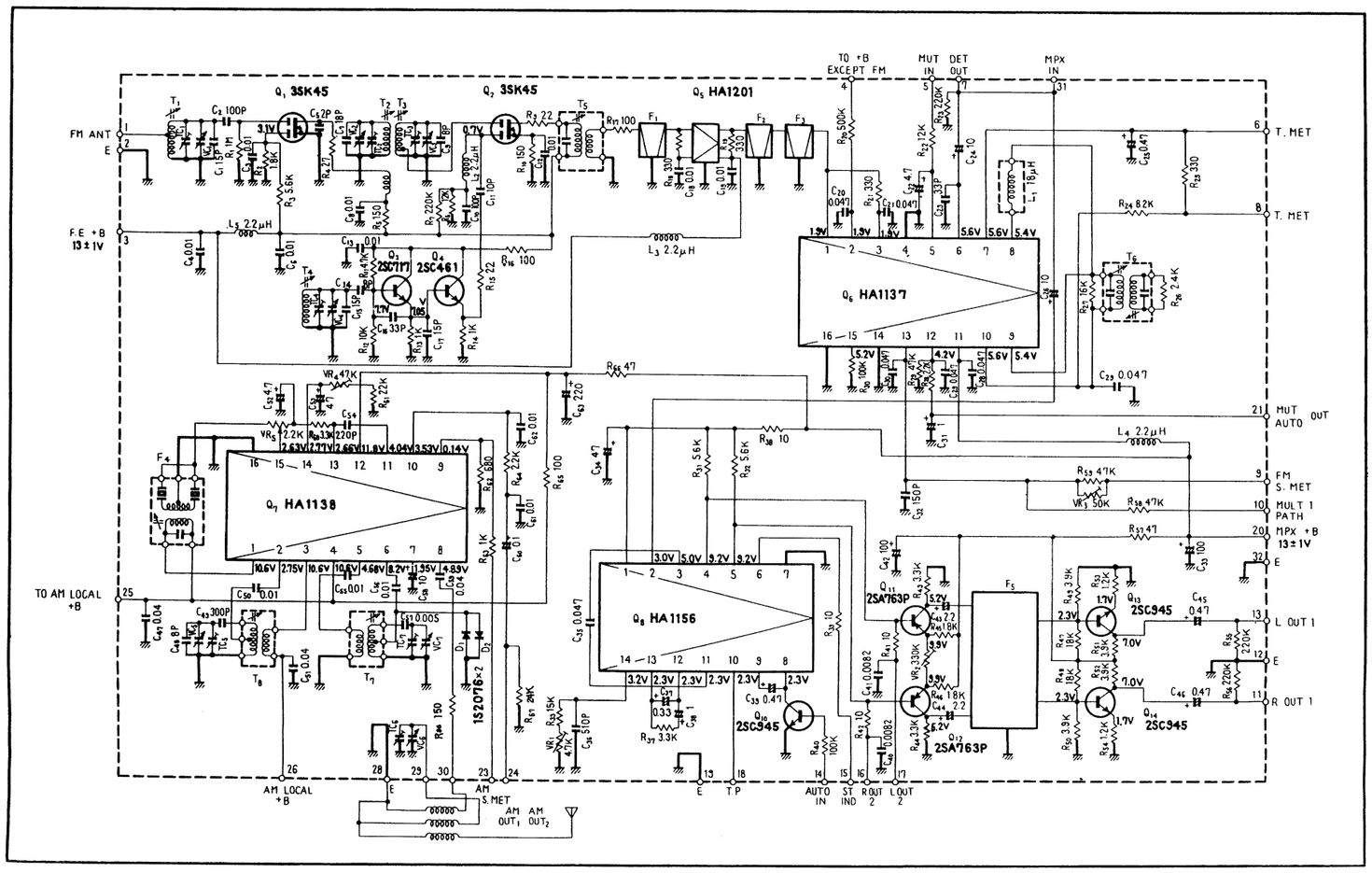
SWITCHES

Symbol	Description	Part No.	
S1	Lever switch (Power)	ASK-066-0	KCU
	Lever switch (Power)	ASK-067-0	F
S2	Relay	ASR-007-0	KCU
S3	Fuse holder	AKR-008-0	KCU
S4	Slide switch	ASH-008-0	F

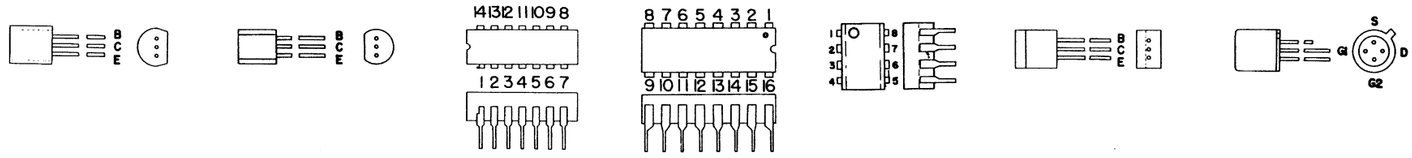
OTHERS

Symbol	Description	Part No.	
	Tuner assembly	AWE-041-A	
	Equalizer amplifier assembly	AWF-011-0	
	Microphone amplifier assembly	AWM-064-0	
	Control amplifier assembly	AWG-029-0	
	Power amplifier assembly	AWH-031-A	
	Protection circuit assembly	AWM-025-C	
	Power supply circuit assembly	AWR-055-A	
	Switch & VR assembly	AWX-070-0	
	Switch circuit assembly (function)	AWS-073-0	
	Switch circuit assembly (FM muting)	AWS-075-0	
	Switch circuit assembly (mode, loudness)	AWS-065-0	
	Switch circuit assembly (filter, AF muting)	AWS-066-0	
	Switch circuit assembly (speakers)	AWS-074-0	
	Lamp board assembly	AWX-069-0	
	5P connector assembly	AWX-062-0	
	Wooden cabinet assembly	AMM-035-B	
	Phono jack - C (6 jacks)	AKB-016-0	
	Phono jack - A (4 jacks)	AKB-014-0	
	Phono jack (1 jack)	AKB-019-0	
	Antenna terminal board	AKA-002-0	
	Binding post for ground	AKE-012-A	
	Power transformer	ATT-168-A	KCU
	Power transformer	ATT-172-0	F
	Ferrite loopstick antenna	ATB-026-0	
	Balun	T22-025-A	
	Pilot lamp 8V, 0.3A (dial scale)	E22-032-0	
	Pilot lamp 8V, 0.3A (meter)	AEL-015-0	
	Pilot lamp 8V, 50mA (position)	AEL-022-0	
	Pilot lamp 8V, 50mA (position)	AEL-024-0	
	Fuse 4A (AC power)	AEK-100-0	KCU
	Fuse 3A (protection)	AEK-101-0	
	Fuse 1A (protection)	AEK-106-0	
	Fuse 2A (AC power)	AEK-103-0	F
	Fuse 4A (protection)	AEK-202-0	KCU
	AC socket	AKP-005-0	
	Speaker output terminal	AKE-014-0	
	Phone jack (Headphone)	K72-026-0	
	Jumper plug	AKM-004-A	
	Fuse holder (AC power)	AKR-001-0	F
	Pilot lamp socket	AKK-002-0	
	AC power cord	ADG-004-0	F
	AC power cord	ADG-005-0	KCU
	FM antenna	ADH-002-0	
	Operating instructions	ARB-101-0	
	Packing case	AHD-213-A	
	Side pad (L)	AHA-066-A	
	Side pad (R)	AHA-067-A	
	Inside packing	AHC-014-A	

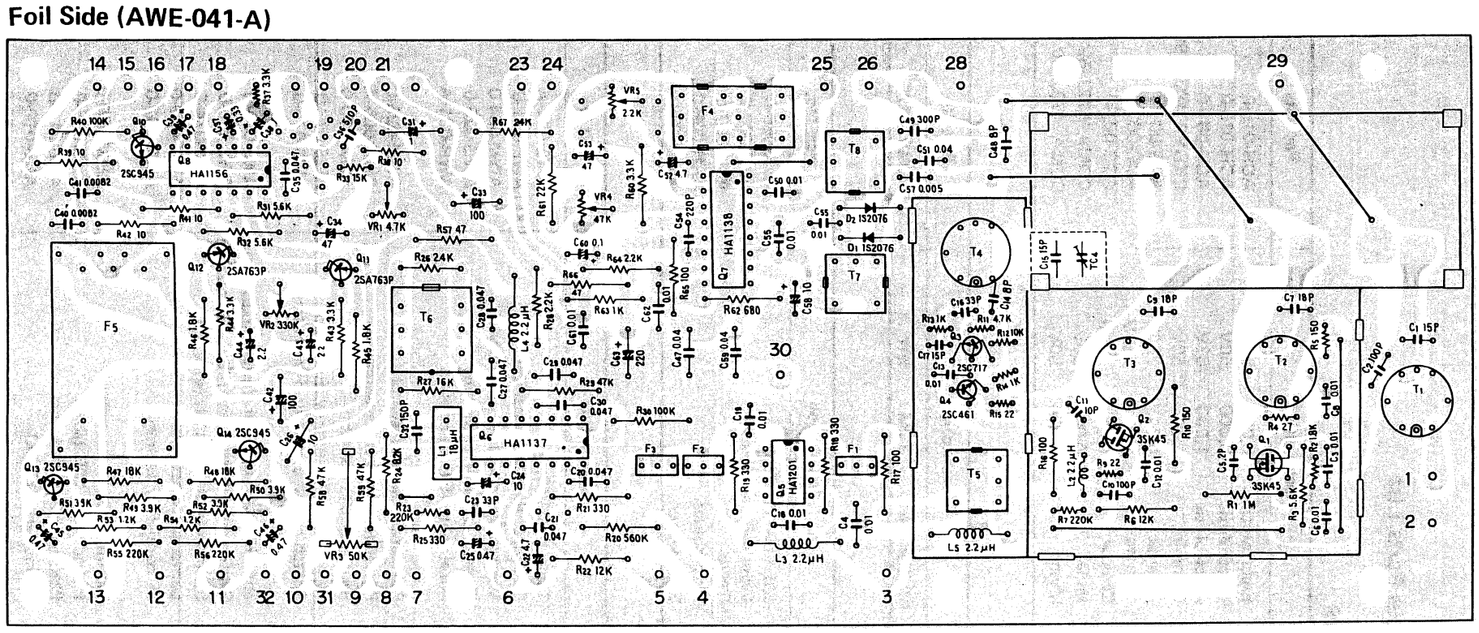
13. 2 TUNER ASSEMBLY (AWE-041-A)



2SA725 | 2SA763P 2SC945 | HA1156 | HA1137 HA1138 | HA1201 | 2SC461 2SC717 | 3SK45



Foil Side (AWE-041-A)



Symbol	Description		Part No.	
C36	Electrolytic	100 6V	CEA 101P 6	
C37	Electrolytic	47 35V	CEA 470P 35	
C38	Electrolytic	47 35V	CEA 470P 35	
C39	Electrolytic	2.2 25V	CSZA 2R2M 25	
C40	Electrolytic	2.2 25V	CSZA 2R2M 25	

RESISTORS AND POTENTIOMETERS

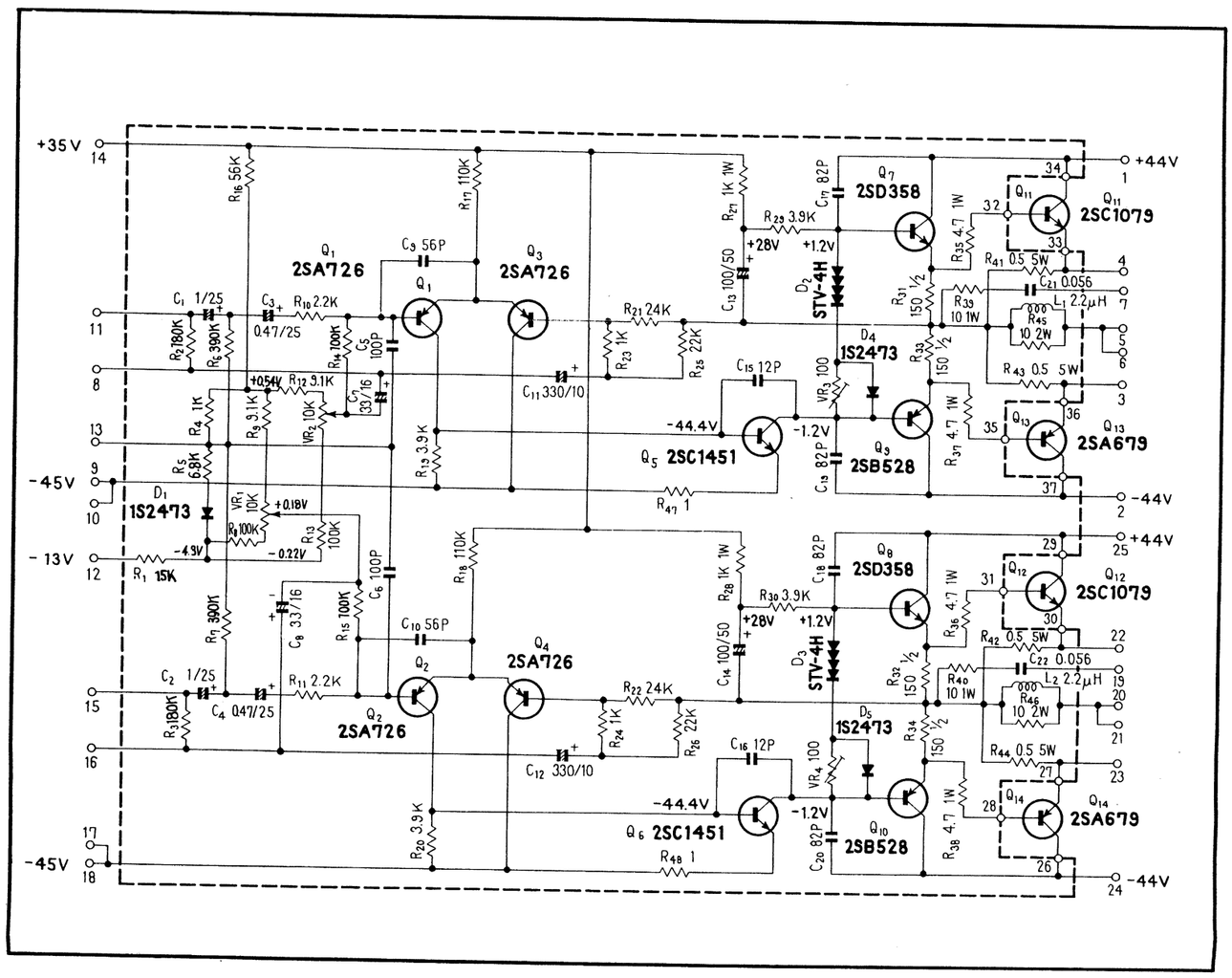
Symbol	Description		Part No.	
VR1	Variable resistor	(100k-B)	ACV-136-0	
VR2	Variable resistor	(100k-B)	ACV-136-0	
R1	Carbon film	1.8k	RD¼PM 182J	
R2	Carbon film	1.8k	RD¼PM 182J	
R3	Carbon film	47k	RD¼PM 473J	
R4	Carbon film	47k	RD¼PM 473J	
R5	Carbon film	1M	RD¼PM 105J	
R6	Carbon film	1M	RD¼PM 105J	
R7	Carbon film	56k	RD¼PM 563J	
R8	Carbon film	56k	RD¼PM 563J	
R9	Carbon film	12k	RD¼PM 123J	
R10	Carbon film	12k	RD¼PM 123J	
R11	Carbon film	3.9k	RD¼PM 392J	
R12	Carbon film	3.9k	RD¼PM 392J	
R13	Carbon film	22k	RD¼PM 223J	
R14	Carbon film	22k	RD¼PM 223J	
R15	Carbon film	36k	RD¼PM 363J	
R16	Carbon film	36k	RD¼PM 363J	
R17	Carbon film	4.7k	RD¼PM 472J	
R18	Carbon film	4.7k	RD¼PM 472J	
R19	Carbon film	10k	RD¼PM 103J	
R20	Carbon film	10k	RD¼PM 103J	
R21	Carbon film	1k	RD¼PM 102J	
R22	Carbon film	1k	RD¼PM 102J	
R23	Carbon film	22k	RD¼PM 223J	
R24	Carbon film	22k	RD¼PM 223J	
R25	Carbon film	22k	RD¼PM 223J	
R26	Carbon film	22k	RD¼PM 223J	
R27	Carbon film	1M	RD¼PM 105J	
R28	Carbon film	1M	RD¼PM 105J	
R29	Carbon film	1M	RD¼PM 105J	
R30	Carbon film	1M	RD¼PM 105J	
R31	Carbon film	12k	RD¼PM 123J	
R32	Carbon film	12k	RD¼PM 123J	
R33	Carbon film	100	RD¼PM 101J	
R34	Carbon film	100	RD¼PM 101J	
R35	Carbon film	6.8k	RD¼PM 682J	
R36	Carbon film	6.8k	RD¼PM 682J	
R37	Carbon film	6.8k	RD¼PM 682J	
R38	Carbon film	6.8k	RD¼PM 682J	

Symbol	Description		Part No.	
R39	Carbon film	560k	RD¼PM 564J	
R40	Carbon film	560k	RD¼PM 564J	
R41	Carbon film	100k	RD¼PM 104J	
R42	Carbon film	100k	RD¼PM 104J	
R43	Carbon film	1.8k	RD¼PM 182J	
R44	Carbon film	1.8k	RD¼PM 182J	
R45	Carbon film	100	RD¼PM 101J	
R46	Carbon film	100	RD¼PM 101J	
R47	Carbon film	2.7k	RD¼PM 272J	
R48	Carbon film	2.7k	RD¼PM 272J	
R49	Carbon film	6.8k	RD¼PM 682J	
R50	Carbon film	6.8k	RD¼PM 682J	
R51	Carbon film	330	RD¼PM 331J	
R52	Carbon film	330	RD¼PM 331J	
R53	Carbon film	220k	RD¼PM 224J	
R54	Carbon film	220k	RD¼PM 224J	

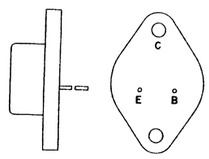
SWITCHES

Symbol	Description	Part No.	
S1	Lever switch (Turn over low)	ASK-071-0	
S2	Lever switch (Turn over high)	ASK-069-0	

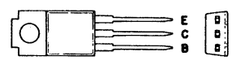
13. 6 POWER AMPLIFIER ASSEMBLY (AWH-031-A)



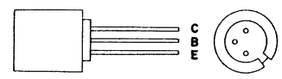
2SA679
2SA747
2SB539
2SD287
2SC1079
2SC1116



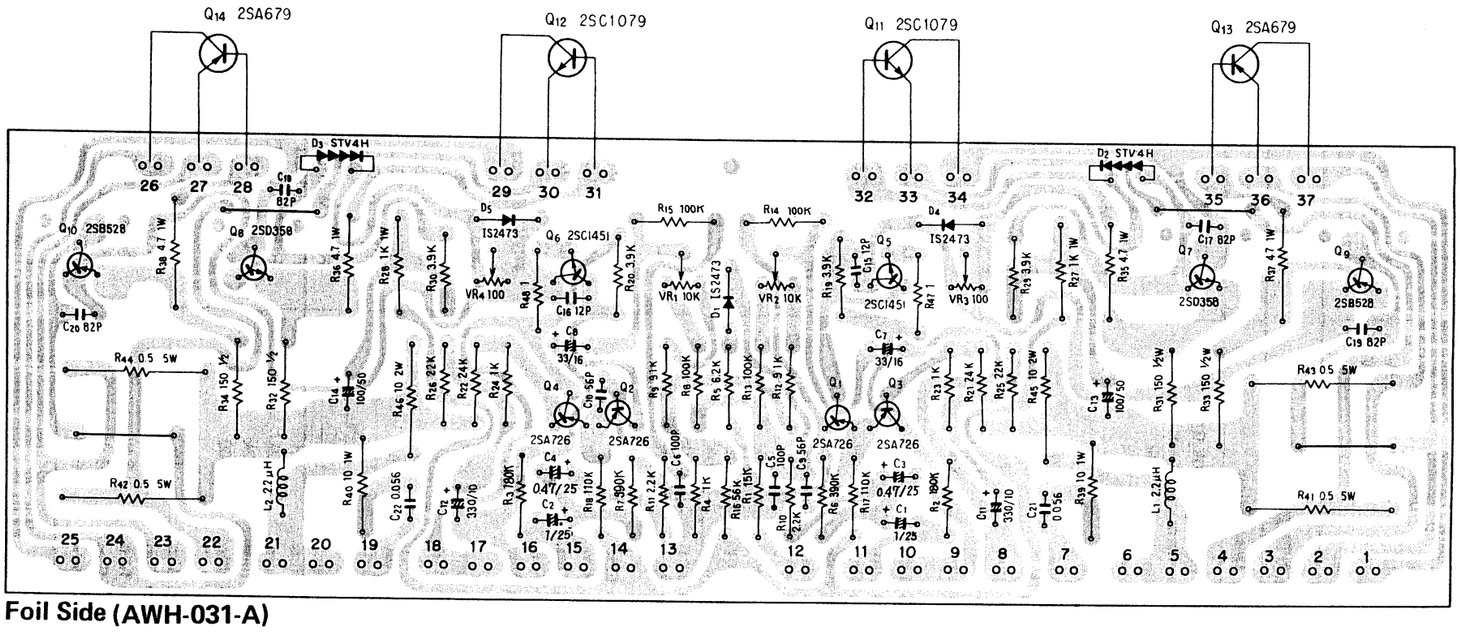
2SB528
2SD358



2SC1451



2SA726


Q14 2SA679
Q12 2SC1079
Q11 2SC1079
Q13 2SA679
D3 STV4H
D2 STV4H
Q10 2SB528
Q8 2SD358
Q6 2SC1451
Q5 2SC1451
Q7 2SD358
Q9 2SB528
D5 IS2473
D4 IS2473
D1 IS2473
Q4 2SA726
Q2 2SA726
Q1 2SA726
Q3 2SA726
R15 100K
R14 100K
VR4 100
VR1 10K
VR2 10K
VR3 100
R48 1
R47 1
R7 1
C16 12P
C15 12P
C17 82P
C18 82P
C19 82P
C20 82P
C8 33/16
C7 33/16
C9 56P
C10 56P
C5 100P
C6 100P
C4 0.47/25
C2 1/25
C1 1/25
C3 0.47/25
C11 330/10
C12 330/10
C14 100/50
C13 100/50
C22 0.056
C21 0.056
L2 2.2μH
L1 2.2μH
R44 0.5 5W
R42 0.5 5W
R43 0.5 5W
R41 0.5 5W
R34 150 ½W
R32 150 ½W
R33 150 ½W
R31 150 ½W
R46 10 2W
R45 10 2W
R40 10 1W
R39 10 1W
R38 4.7 1W
R36 4.7 1W
R35 4.7 1W
R37 4.7 1W
R26 22K
R22 24K
R24 1K
R23 1K
R25 22K
R21 24K
R18 110K
R17 110K
R16 56K
R19 3.9K
R20 3.9K
R30 3.9K
R29 3.9K
R28 1K 1W
R27 1K 1W
R21 1K 1W
R12 9.1K
R9 9.1K
R4 1K
R5 6.8K
R8 100K
R13 100K
VR2 10K
R1 15K
R3 180K
R6 390K
R7 390K
R10 22K
R11 2.2K
R2 180K
R31 3.9K
R43 3.9K
R1 56K
R5 6.2K
R9 91K
R10 1K
R4 1K
R11 2.2K
R7 390K
R8 110K
R6 390K
R2 180K
R3 180K
R1 15K
R13 100K
R12 9.1K
R9 100K
R5 6.2K
R4 1K
R10 22

Parts List of Protection Circuit Assembly (AWM-025-C)

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SC869-C, B or D (2SC857K-A) (2SC1515K)		
Q2	Transistor	2SC869-C, B or D (2SC857K-A) (2SC1515K)		
Q3	Transistor	2SC945-Q or R		
Q4	Transistor	2SC945-Q or R		
Q5	Transistor	2SA733-Q or R		
Q6	Transistor	2SC945-Q or R		
Q7	Transistor	2SC1384-R or Q		
D1	Diode	1S2472		
D2	Diode	1S2472		
D3	Diode	1S2472		
D4	Diode	1S2472		
D5	Diode	1S2472		
D6	Diode	1S2473		
D7	Diode	1S2473		
D8	Diode	1S2473		

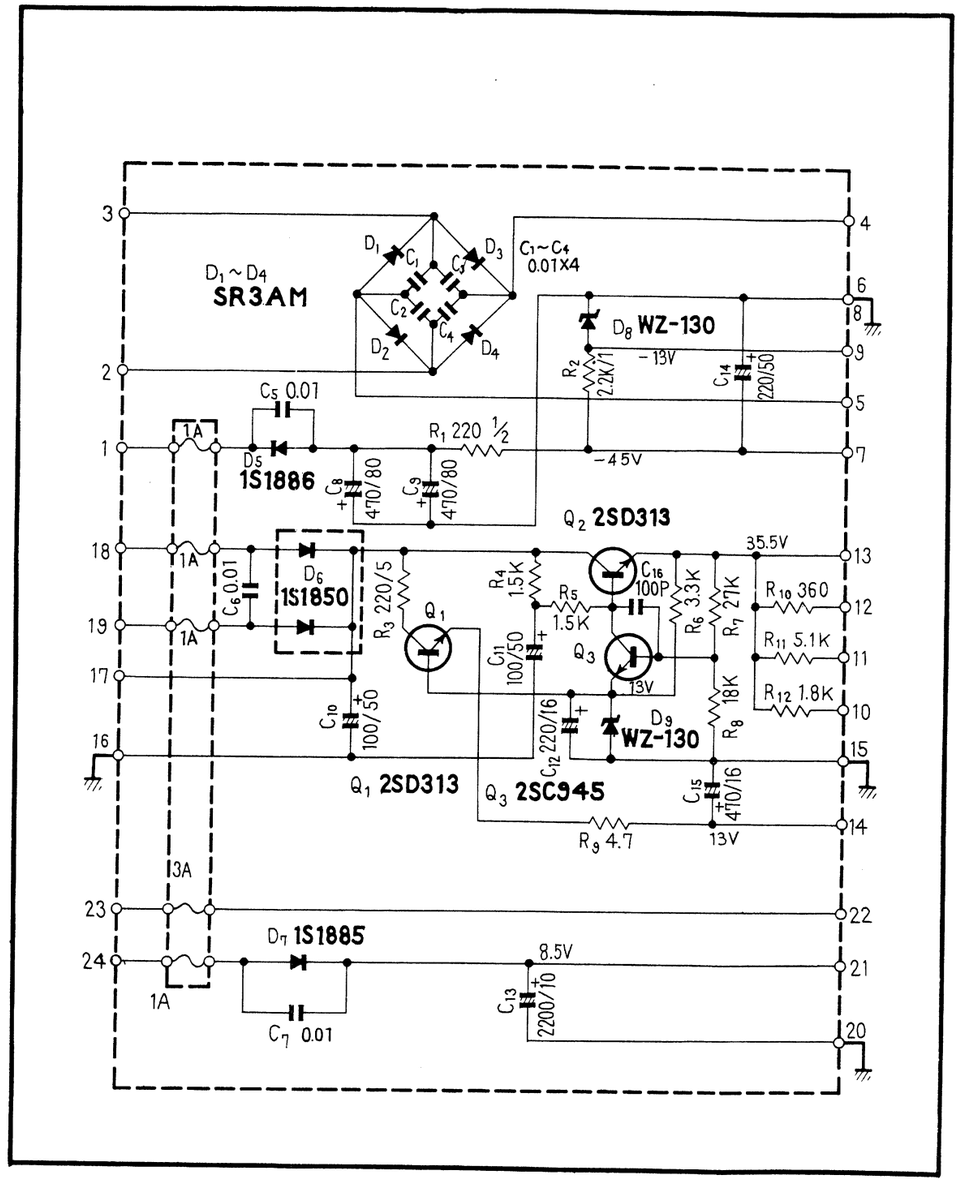
RESISTORS

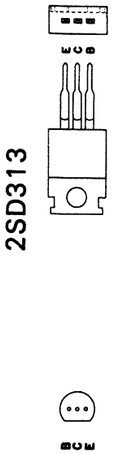
Symbol	Description		Part No.	
R1	Carbon film	2.7k	RD¼PS 272J	
R2	Carbon film	2.7k	RD¼PS 272J	
R3	Carbon film	2.7k	RD¼PS 272J	
R4	Carbon film	2.7k	RD¼PS 272J	
R5	Carbon film	15k	RD¼PS 153J	
R6	Carbon film	15k	RD¼PS 153J	
R7	Carbon film	15k	RD¼PS 153J	
R8	Carbon film	15k	RD¼PS 153J	
R9	Carbon film	47k	RD¼PS 473J	
R10	Carbon film	47k	RD¼PS 473J	
R11	Carbon film	2.2k	RD¼PS 222J	
R12	Carbon film	2.2k	RD¼PS 222J	
R13	Carbon film	15k	RD¼PS 153J	
R14	Carbon film	15k	RD¼PS 153J	
R15	Carbon film	82	RD¼PS 820J	
R16	Carbon film	82	RD¼PS 820J	
R17	Carbon film	5.6k	RD¼PS 562J	
R18	Carbon film	150k	RD¼PS 154J	
R20	Carbon film	15k	RD¼PS 153J	
R21	Carbon film	15k	RD¼PS 153J	
R22	Carbon film	68k	RD¼PS 683J	
R23	Carbon film	12k	RD¼PS 123J	
R24	Carbon film	15k	RD¼PS 153J	
R25	Carbon film	2.2k	RD¼PS 222J	
R26	Carbon film	68k	RD¼PS 683J	
R27	Carbon film	22	RD¼PS 220J	
R28	Metal oxide	220 1W	RS1P 221J	
R29	Carbon film	47k	RD¼PS 473J	

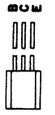
CAPACITORS

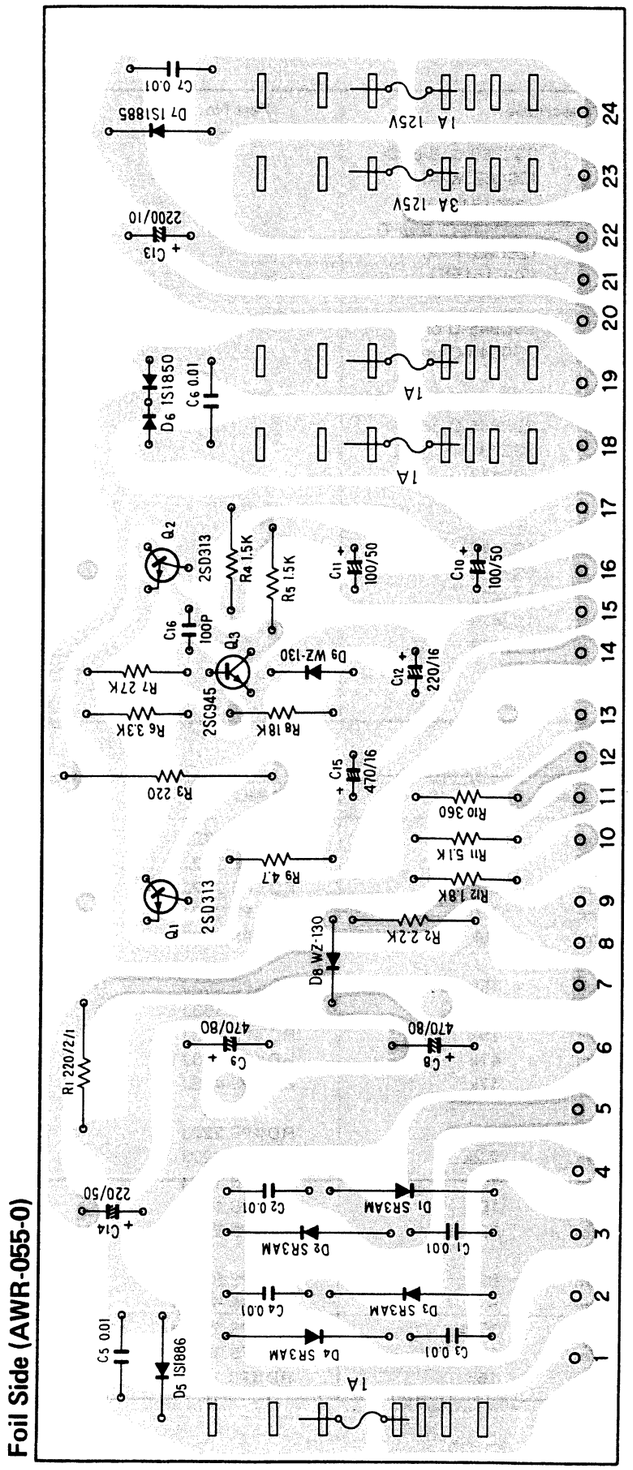
Symbol	Description			Part No.	
C1	Electrolytic	0.22	10V	CSSA R22M 10	
C2	Electrolytic	0.22	10V	CSSA R22M 10	
C3	Electrolytic	330	6V	CEA 331P 6	
C4	Electrolytic	330	6V	CEA 331P 6	
C5	Electrolytic	4.7	25V	CEA 4R7P 25	
C6	Electrolytic	100	16V	CEA 101P 16	

13. 8 POWER SUPPLY CIRCUIT ASSEMBLY (AWR-055-0)





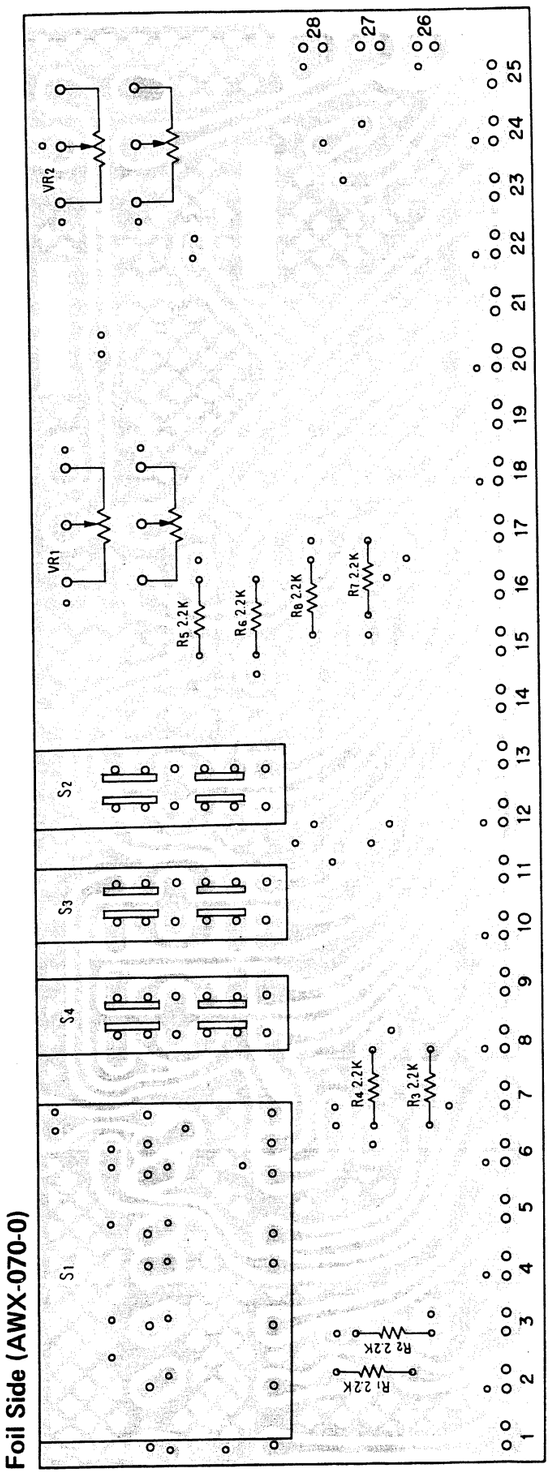




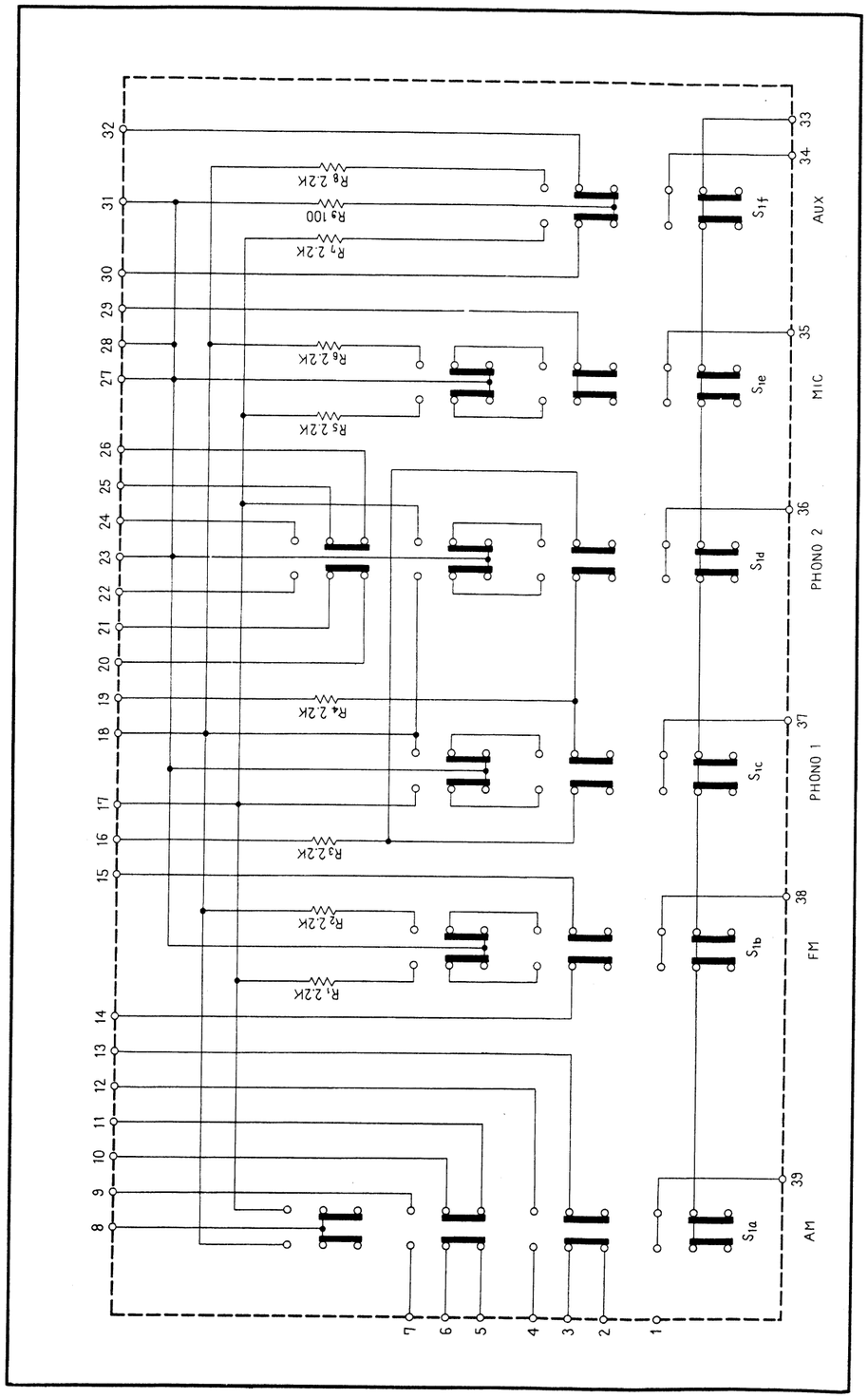
Parts List of Switch & Volume Assembly (AWX-070-0)

Symbol	Description		Part No.	
VR1	Variable resistor	250k-HB (Balance)	ACV-135-0	
VR2	Variable resistor	250k-B1 (Volume)	ACV-134-0	
S1	Rotary switch	(Rec selector)	ASD-017-0	
S2	Lever switch	(Monitor 1)	ASK-072-0	
S3	Lever switch	(Monitor 2)	ASK-072-0	
S4	Lever switch	(NR adaptor)	ASK-072-0	
R1	Carbon film	2.2k	RD¼PS 222J	
R2	Carbon film	2.2k	RD¼PS 222J	
R3	Carbon film	2.2k	RD¼PS 222J	
R4	Carbon film	2.2k	RD¼PS 222J	
R5	Carbon film	2.2k	RD¼PS 222J	
R6	Carbon film	2.2k	RD¼PS 222J	
R7	Carbon film	2.2k	RD¼PS 222J	
R8	Carbon film	2.2k	RD¼PS 222J	

Foil Side (AWX-070-0)

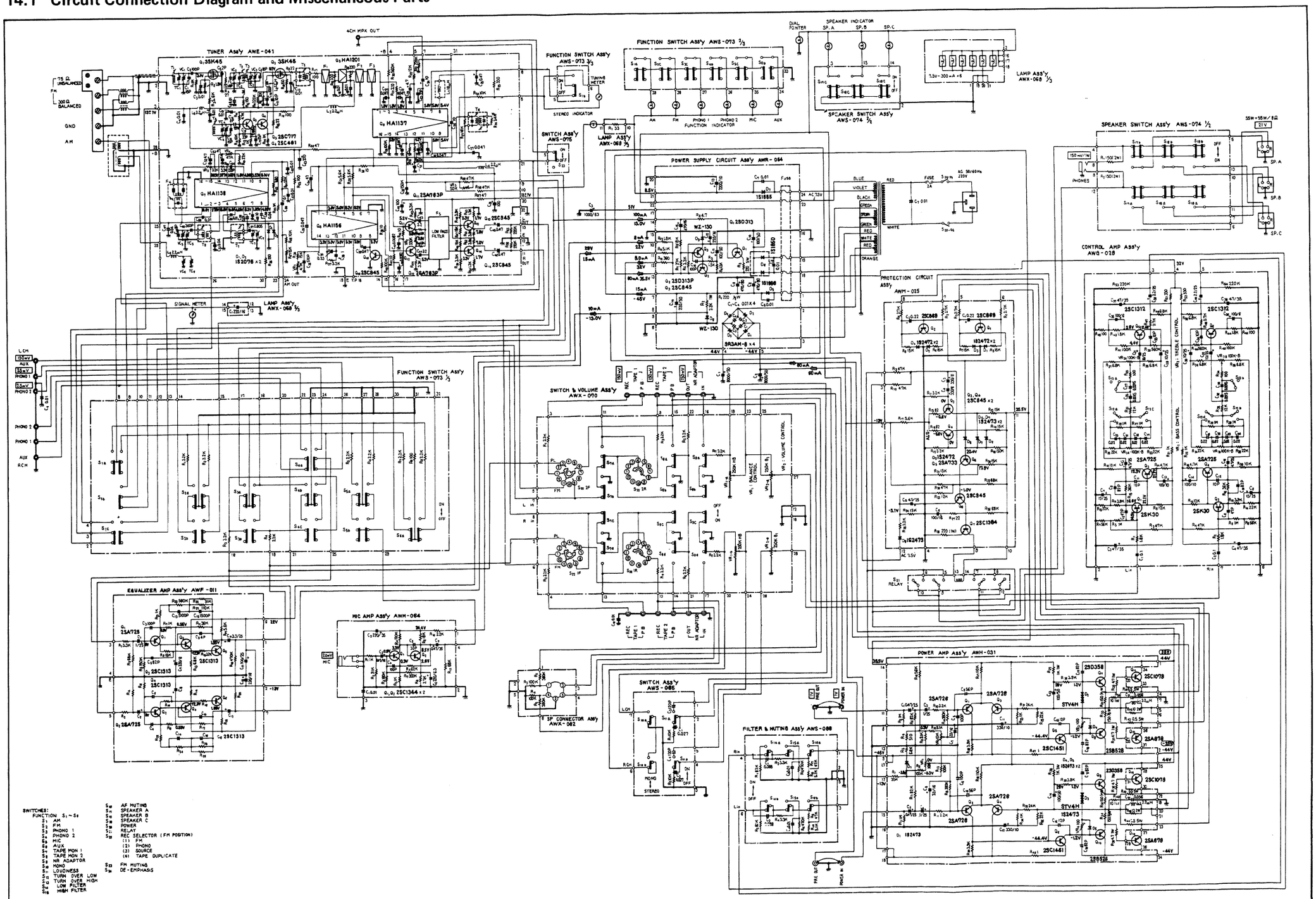


13.10 SWITCH CIRCUIT ASSEMBLY (AWS-073-0)



14. SCHEMATIC DIAGRAMS, P.C.BOARD PATTERNS AND PARTS LIST FOR 220V ONLY MODEL

14.1 Circuit Connection Diagram and Miscellaneous Parts



• CAPACITORS: IN μF UNLESS OTHERWISE NOTED p: pF
• RESISTORS: INΩ, ¼W UNLESS OTHERWISE NOTED k: kΩ, M: MΩ

Miscellaneous Parts List

CAPACITORS

Symbol	Description	Part No.	
C1	Electrolytic 8,000 50V	ACH-015-0	
C2	Electrolytic 8,000 50V	ACH-015-0	
C3	Electrolytic 1,000 63V	ACH-001-C	
C4	Ceramic 0.01 50V	CKDYF 103Z 50	
C7	Ceramic 0.01 250V	ACG-001-0	
C10	Ceramic 0.01 50V	CKDYF 103Z 50	

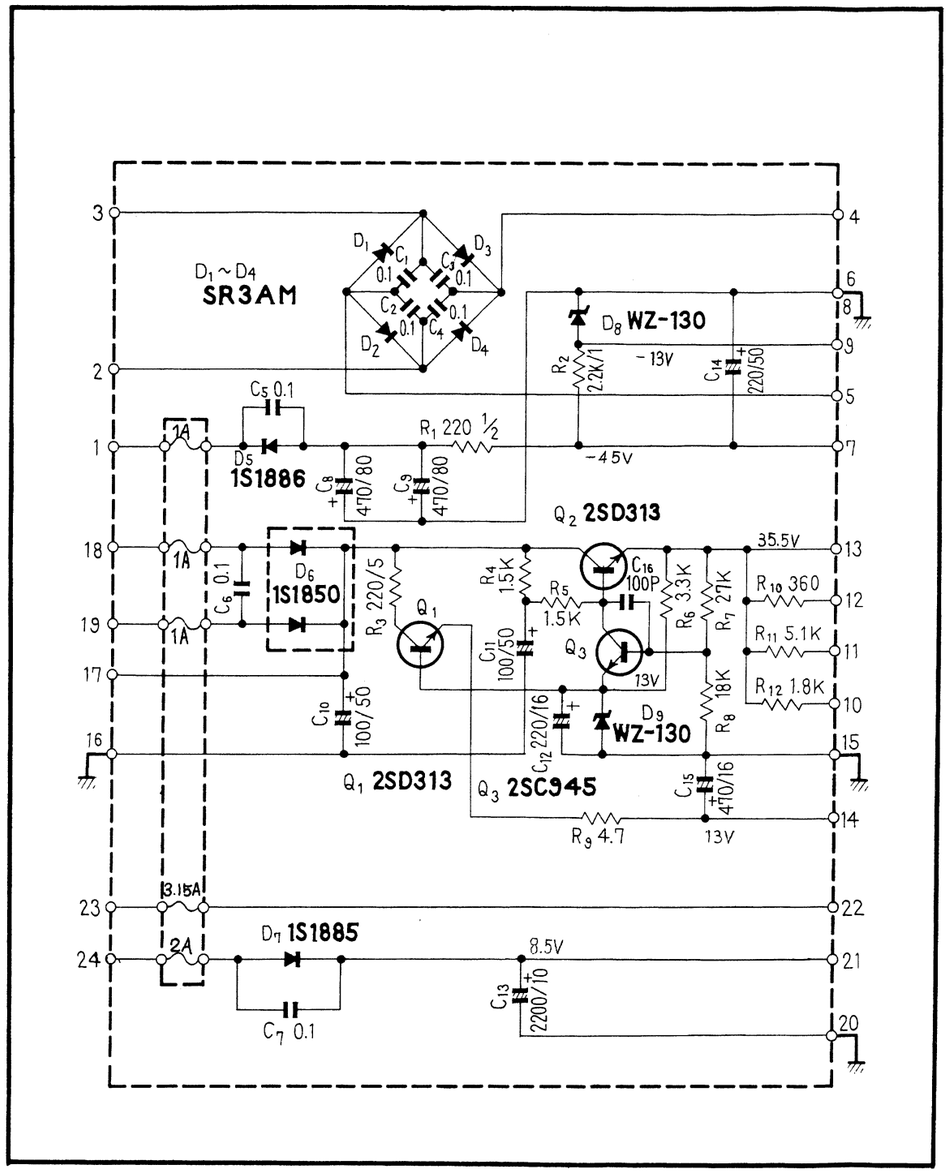
SWITCHES

Symbol	Description	Part No.	
S1	Lever switch (Power)	ASK-068-0	
S2	Relay	ASR-007-0	

OTHERS

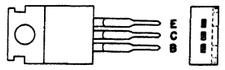
Symbol	Description	Part No.	
	Tuner assembly	AWE-041-A	
	Equalizer amplifier assembly	AWF-011-0	
	Microphone amplifier assembly	AWM-064-0	
	Control amplifier assembly	AWG-029-0	
	Power amplifier assembly	AWH-031-A	
	Protection circuit assembly	AWM-025-C	
	Power supply circuit assembly	AWR-064-0	
	Switch & VR assembly	AWX-070-0	
	Switch circuit assembly (function)	AWS-073-0	
	Switch circuit assembly (FM muting)	AWS-075-0	
	Switch circuit assembly (mode, loudness)	AWS-065-0	
	Switch circuit assembly (filter, AF muting)	AWS-066-0	
	Switch circuit assembly (speakers)	AWS-074-0	
	Lamp loard assembly	AWX-069-0	
	5P connector assembly	AWX-062-0	
	Wooden cabinet assembly	AMM-035-B	
	Phono jack - C (6 jacks)	AKB-016-0	
	Phono jack - A (4 jacks)	AKB-014-0	
	Phono jack (1 jack)	AKB-019-0	
	Antenna terminal board	AKA-002-0	
	Binding post for ground	AKE-012-A	
	Power transformer	ATT-181-0	
	Ferrite loopstick antenna	ATB-026-0	
	Balun	T22-025-A	
	Pilot lamp 8V, 0.3A (dial scale)	E22-032-0	
	Pilot lamp 8V, 0.3A (meter)	AEL-015-0	
	Pilot lamp 8V, 50mA (position)	AEL-022-0	
	Pilot lamp 8V, 50mA (position)	AEL-024-0	
	Fuse 3.15A (protection)	AEK-042-0	
	Fuse 1A (protection)	E21-031-0	
	Fuse 2A (protection)	AEK-017-0	
	Pilot lamp 6V, 30mA (stereo indicator)	AEL-014-0	
	Speaker output terminal	AKE-014-0	
	Phone jack (Headphone)	K72-026-0	
	Jumper plug	AKM-004-A	
	Fuse holder (protection)	K91-088-C	
	PL socket	AKK-002-0	
	Connector (AC power)	AKP-008-0	
	FM antenna	ADH-002-0	
	Operating instructions (English)	ARB-101-0	
	Operating instructions (French/German)	ARD-067-0	
	Packing case	AHD-213-A	
	Side pad (L)	AHA-066-A	
	Side pad (R)	AHA-067-A	
	Inside packing	AHC-014-A	

14.2 Power Supply Circuit Assembly (AWR-064-0)

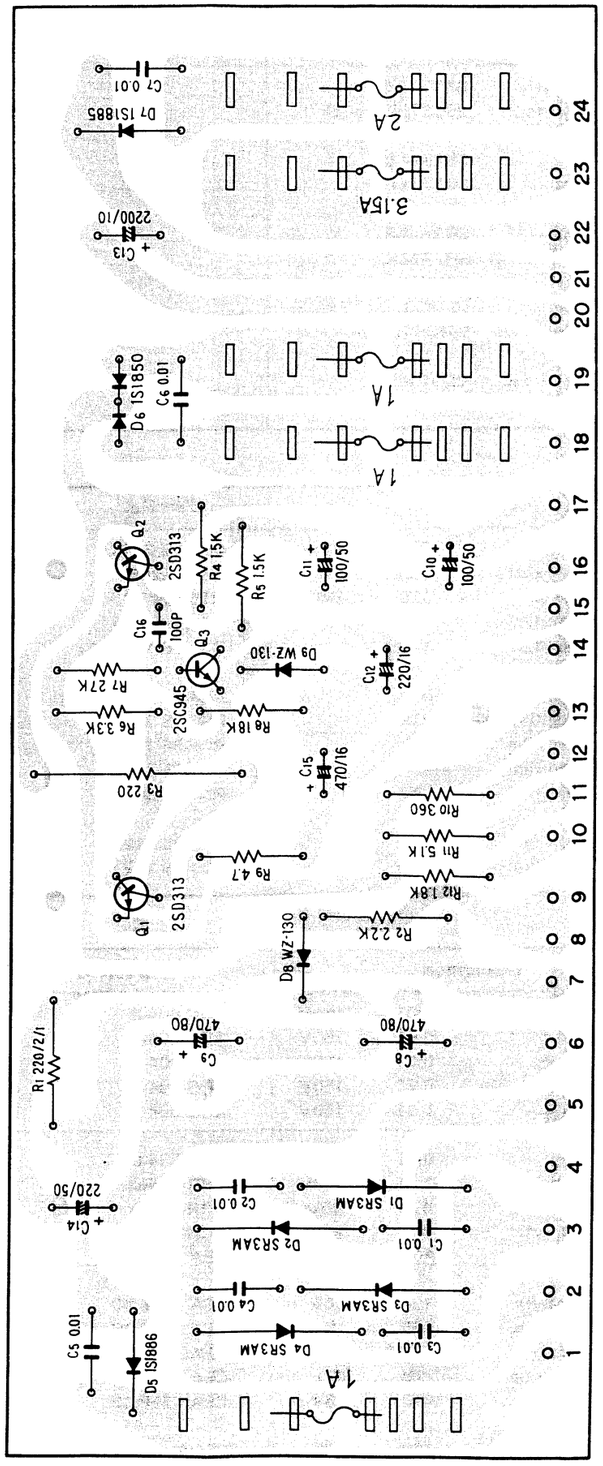


2SC945

2SD313



Foil Side (AWR-064-0)



Parts List of Power Supply Circuit Assembly (AWR-064-0)

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	Transistor	2SD313-E		
Q2	Transistor	2SD313P-E or D		
Q3	Transistor	2SC945-Q or R		
D1	Diode	SR3AM-8		
D2	Diode	SR3AM-8		
D3	Diode	SR3AM-8		
D4	Diode	SR3AM-8		
D5	Diode	1S1886		
D6	Diode	1S1850		
D7	Diode	1S1885		
D8	Zener diode	WZ-130		
D9	Zener diode	WZ-130		

RESISTORS

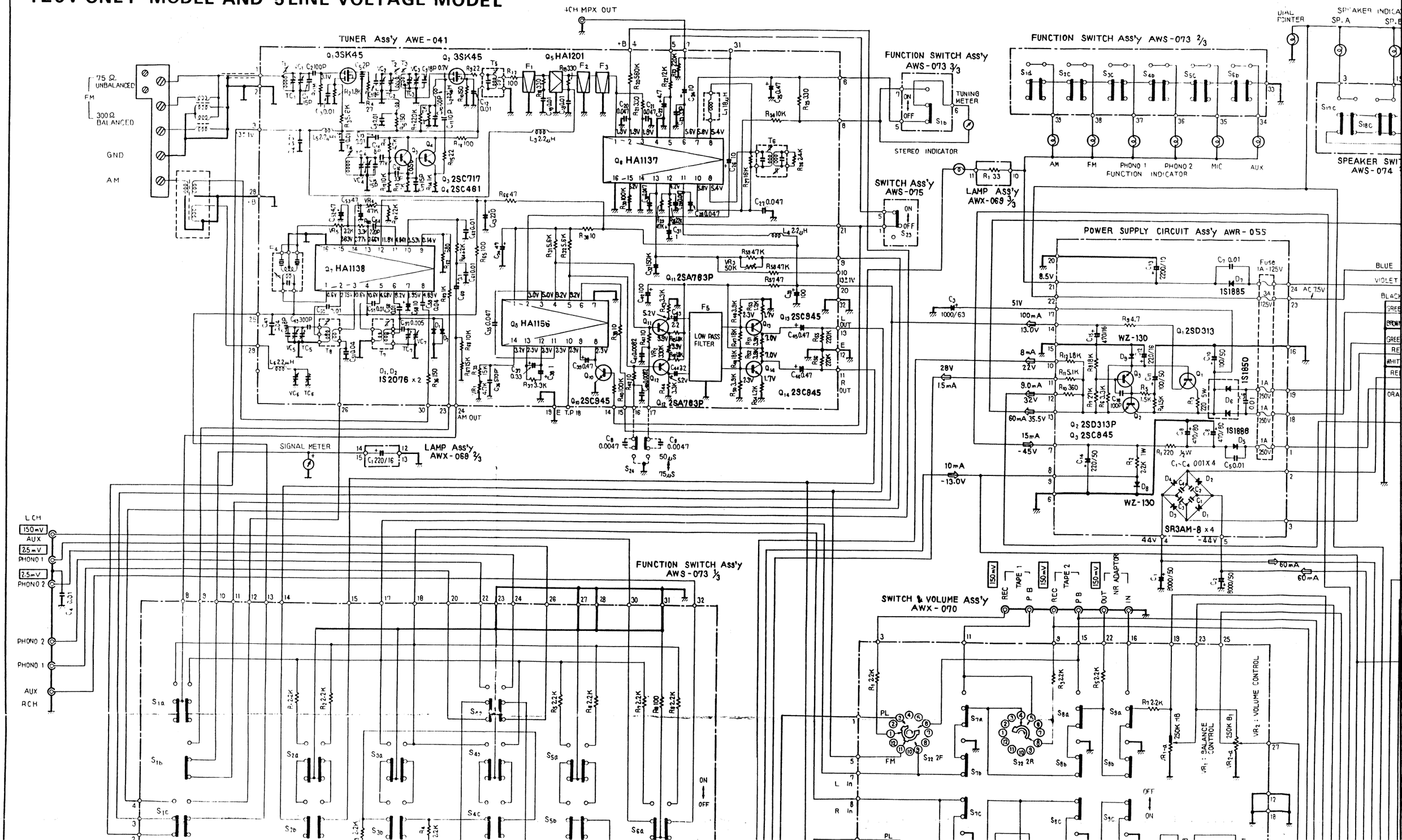
Symbol	Description			Part No.	
R1	Carbon film	220	½W	RD½PS 221J	
R2	Metal oxide	2.2k	1W	RS1P 222K	
R3	Wire wound	220	5W	RT5B 221K	
R4	Carbon film	1.5k		RD¼PS 152J	
R5	Carbon film	1.5k		RD¼PS 152J	
R6	Carbon film	3.3k		RD¼PS 332J	
R7	Carbon film	27k		RD¼PS 273J	
R8	Carbon film	18k		RD¼PS 183J	
R9	Carbon film	4.7		RD¼PS 4R7J	
R10	Carbon film	360		RD¼PS 361J	
R11	Carbon film	5.1k		RD¼PS 512J	
R12	Carbon film	1.8k		RD¼PS 182J	

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	150V	ACG-004-0	
C2	Ceramic	0.01	150V	ACG-004-0	
C3	Ceramic	0.01	150V	ACG-004-0	
C4	Ceramic	0.01	150V	ACG-004-0	
C5	Ceramic	0.01	150V	ACG-004-0	
C6	Ceramic	0.01	150V	ACG-004-0	
C7	Ceramic	0.01	150V	ACG-004-0	
C8	Electrolytic	470	80V	ACH-038-0	
C9	Electrolytic	470	80V	ACH-038-0	
C10	Electrolytic	100	50V	CEA 101P 50	
C11	Electrolytic	100	50V	CEA 101P 50	
C12	Electrolytic	220	16V	CEA 221P 16	
C13	Electrolytic	2,200	10V	CEA 222P 10	
C14	Electrolytic	220	50V	CEA 221P 50	
C15	Electrolytic	470	16V	CEA 471P 16	
C16	Ceramic	100p	50V	CCDSL 101K 50	

PIONEER SX-838 KCU, F, GN

120V ONLY MODEL AND 5 LINE VOLTAGE MODEL



FUNCTION SWITCH ASS'y AWS-073 2/3

FUNCTION SWITCH ASS'y AWS-073 3/3

STEREO INDICATOR

TUNING METER

AM FM PHONO 1 PHONO 2 MIC AUX

FUNCTION INDICATOR

DIAL POINTER

SPEAKER INDICATOR SP. A SP. B SP. C

SPEAKER SWITCH ASS'y AWS-074 2/2

LAMP ASS'y AWX-069 1/3

7.5V-300mA x6

SWITCH ASS'y AWS-075

LAMP ASS'y AWX-069 2/3

POWER SUPPLY CIRCUIT ASS'y AWR-055

Fuse 1A-125V

3A 125V

AC 7.5V

1S1885

1S1850

WZ-130

SR3AM-8 x4

Q1 2SD313

Q2 2SD313P

Q3 2SC845

1S1886

8.5V 51V 100mA 13.0V 8mA 22V 28V 15mA 9.0mA 32V 60mA 35.5V 15mA -45V 10mA -13.0V 44V -44V 60mA

BLUE VIOLET BLACK GREEN BROWN GREEN RED WHITE RED ORANGE GRAY RED ORANGE BROWN YELLOW WHITE

(4A 110/120/130V) (2A 220/240V)

Fuse S20 1/2 C6 0.01

AC 50/60Hz 110/120/130 220/240V

SWITCHED 100W MAX

UNSWITCHED TOTAL 200W MAX

SPEAKER SWITCH ASS'y AWS-074 1/2

55W+55W/8Ω 21V

150mV/1K R1 150 2W PHONES R2 150(2W)

SP. A SP. B SP. C

SWITCH & VOLUME ASS'y AWX-070

150mV REC TAPE 1 PB 150mV REC TAPE 2 PB 150mV OUT NR ADAPTOR IN

VR1 : BALANCE CONTROL

VR2 : VOLUME CONTROL

PL FM

L in R in

S22 2F S22 2R

ON OFF

PROTECTION CIRCUIT ASS'y AWM-025

Q1 2SC869 Q2 2SC869

D4 1S2472 x2 D1 1S2472 x2

Q3, Q4 2SC945 x2

D6, D7 1S2473 x2

D8 1S2472 Q5 2SA733

Q6 2SC1384

-13V

CONTROL AMP ASS'y AWG-029

VR1 : TREBLE CONTROL VR2 : BASS CONTROL

2SC1312 2SC1312

2SA725 2SA725

2SK30 2SK30

32V 4.4V 3.8V 15.3V 21.1V 18.6V 14.5V

LOW PASS FILTER F5

Q13 2SC945 Q14 2SC845

2SA763P

SWITCH Ass'y S-073 1/3

FUNCTION SWITCH Ass'y
AWS-073 1/3

SWITCH & VOLUME Ass'y
AWX-070

EQUALIZER AMP Ass'y AWF-011

MIC AMP Ass'y AWM-064

SWITCH Ass'y
AWS-085

FILTER & MUTING Ass'y AWS-086

5P CONNECTOR Ass'y
AWX-062

POWER SUPPLY CIRCUIT FOR 120V ONLY MODEL

SWITCHES:
FUNCTION S1 ~ S6
- S1 AM
- S2 FM
- S3 PHONO 1
- S4 PHONO 2
- S5 MIC
- S6 AUX
- S7 TAPE MON 1
- S8 TAPE MON 2
- S9 NR ADAPTOR
- S10 MONO
- S11 LOUDNESS
- S12 TURN OVER LOW
- S13 TURN OVER HIGH
- S14 LOW FILTER
- S15 HIGH FILTER
- S16 AF MUTING
- S17 SPEAKER A
- S18 SPEAKER B
- S19 SPEAKER C
- S20 POWER
- S21 RELAY
- S22 REC SELECTOR (FM POSITION)
  - (1) FM
  - (2) PHONO
  - (3) SOURCE
  - (4) TAPE DUPLICATE
- S23 FM MUTING
- S24 DE-EMPHASS

NOTES:
- Neither switch(S24) nor capacitors(C8 & C9) are provided for FTZ-approved unit.
- No switch(S24) is provided for 120V unit, but capacitors(C8 & C9) are provided.

SWITCH & VOLUME ASS'y
AWX-070

SWITCH ASS'y
AWS-065

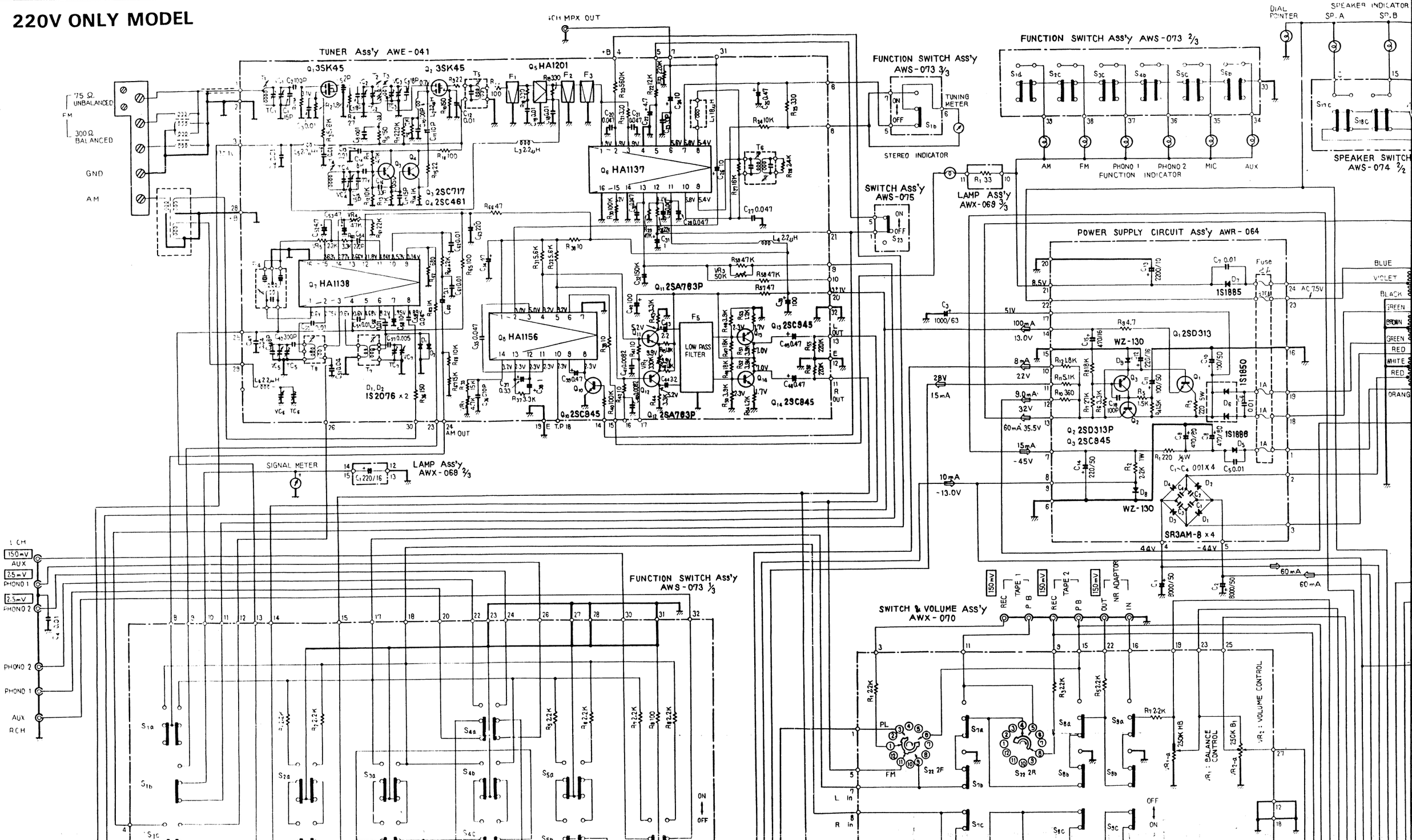
5P CONNECTOR ASS'y
AWX-062

FILTER & MUTING ASS'y AWS-088

POWER AMP ASS'y AWH-031

POWER SUPPLY CIRCUIT FOR 120V ONLY MODEL

220V ONLY MODEL



FUNCTION SWITCH ASS'y AWS-073 3/3

STEREO INDICATOR

FUNCTION SWITCH ASS'y AWS-073 2/3

AM FM PHONO 1 PHONO 2 MIC AUX

FUNCTION INDICATOR

DIAL POINTER

SPEAKER INDICATOR SP.A SP.B SP.C

SPEAKER SWITCH ASS'y AWS-074 2/2

7.5V-300mA x6

LAMP ASS'y AWX-069 1/3

SWITCH ASS'y AWS-075

LAMP ASS'y AWX-069 3/3

POWER SUPPLY CIRCUIT ASS'y AWR-064

SR3AM-8 x4

1S1885 1S1888 WZ-130

Q1 2SD313 Q2 2SD313P Q3 2SC845

SWITCH & VOLUME ASS'y AWX-070

PROTECTION CIRCUIT ASS'y AWM-025

Q3, Q4 2SC845 x2

D6, D7 1S2473 x2

D4 1S2472 x2

D8 1S2472 Q5 2SA733

Q7 2SC1384

SPEAKER SWITCH ASS'y AWS-074 1/2

55W+55W/8Ω 21V

SP.A SP.B SP.C

PHONES

CONTROL AMP ASS'y AWG-029

2SC1312 2SK30 2SA725

VR1: TREBLE CONTROL

VR1: BASS CONTROL

VR1: BALANCE CONTROL

VR1: VOLUME CONTROL

AC 50/60Hz 220V

FUSE 2A

FUNCTION SWITCH Ass'y
AWS-073 1/3

SWITCH & VOLUME Ass'y
AWX-070

EQUALIZER AMP Ass'y AWF-011

MIC AMP Ass'y AWM-064

SWITCH Ass'y
AWS-085

5P CONNECTOR Ass'y
AWX-062

FILTER & MUTING Ass'y AWS-086

SWITCHES:
FUNCTION S1 ~ S6
- S1 AM
- S2 FM
- S3 PHONO 1
- S4 PHONO 2
- S5 MIC
- S6 AUX
- S7 TAPE MON 1
- S8 TAPE MON 2
- S9 NR ADAPTOR
- S10 MONO
- S11 LOUDNESS
- S12 TURN OVER LOW
- S13 TURN OVER HIGH
- S14 LOW FILTER
- S15 HIGH FILTER
- S16 AF MUTING
- S17 SPEAKER A
- S18 SPEAKER B
- S19 SPEAKER C
- S20 POWER
- S21 RELAY
- S22 REC SELECTOR (FM POSITION)
  - (1) FM
  - (2) PHONO
  - (3) SOURCE
  - (4) TAPE DUPLICATE
- S23 FM MUTING
- S24 DE-EMPHASIS

2SC869
2SC1312
2SA725
2SA726

2SA763P
2SC945
2SC1313

HA1156

HA1137
HA1138

HA1201

2SC461
2SC717
2SC1345
2SC1344

3SK45

2SA747
2SA679
2SB539
2SC287
2SC1079
2SC1116

2SB528
2SD358

2SC1451

2SD3

SWITCH & VOLUME ASS'y
AWX-070

SWITCH ASS'y
AWS-065

5P CONNECTOR ASS'y
AWX-062

FILTER & MUTING ASS'y AWS-066

POWER AMP ASS'y AWH-031

S21 RELAY

2SA747
2SA679
2SB539
2SC287
2SC1079
2SC1116

3SK45

2SB528
2SD358

2SC1451

2SD313

2SC1515

2SK30

2SC1384